



# SARA SOUEIDAN ON UI

# MAP SHADERS TO 3D MESHES

Use shaders to make materials for three.js shapes

The voice of web design

# net

# FIND THE PERFECT FRAMEWORK

\*JAVASCRIPT LIBRARIES

Pick the right JS library for your project

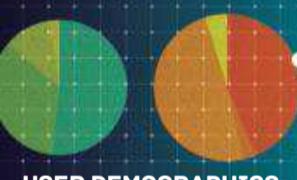
Issue 310 : September 2018 : [net.creativebloq.com](http://net.creativebloq.com)

## INSIDE INVISION STUDIO

Time prototype animations perfectly

55 sec

TIME ON PAGE



USER DEMOGRAPHICS

RESULTS VS BENCHMARK

## BECOME A

# UX TESTING EXPERT

HARNESS USER INSIGHTS TO PRODUCE  
MORE POLISHED SITES

A/B TEST RESULTS

155k  
125k

PAGE VIEWS /  
UNIQUE PAGE VIEWS

BOUNCE RATE

6%

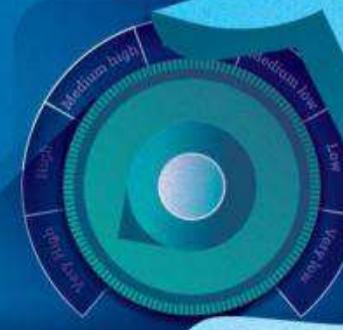
CONVERSION RATE

DEFINE YOUR AIMS

BENCHMARK DATA

RUN EFFECTIVE USER TESTS

UNDERSTAND THE RESULTS



PRODUCE REUSABLE  
COMPONENTS IN STORYBOOK



STRETCH YOUR APP  
DEV WINGS WITH FLUTTER



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\*WELCOME

# EDITOR'S NOTE

While there is undoubtedly an art to web design, sometimes it is easy to confuse this with a lack of rigour and exactitude. In fact, front-end disciplines like prototyping, animation and user experience require just as methodical and disciplined an execution as back-end architecture work, which is why it's important to approach the subject with the mentality of a scientist.

That's why this issue we've been probing the world of UX testing and looking at how designers can systematically investigate how user-friendly their interface is. Joshua Garity takes you through the steps required to conduct thorough tests from

setting benchmarks to sidestepping potential biases in your participant selection.

And we're also exploring other ways to add precision to disciplines that may seem muddy or ill-defined. Burke Holland puts JavaScript frameworks under the microscope, helping you pick the perfect library for your project, whether that be well-established solutions like React or up-and-comers like Cycle. Finally, we evaluate InVision Studio and look at how the screen design tool can bring perfect order to your transitions and animations, enabling you to produce perfectly choreographed prototypes.

Enjoy the issue!

## FEATURED AUTHORS

### JOSHUA GARITY



Garity has refined user experience strategies for some of the world's top organisations with his agency Candorem. On page 60, he reveals how you can probe the performance of your UX.

w: [www.candorem.com](http://www.candorem.com)

### BURKE HOLLAND



Senior developer advocate for Microsoft, Holland is a big fan of JavaScript. Which makes him the perfect person to offer insight on page 68 on the relative benefits of frameworks such as React and Vue.js.  
t: @burkeholland

### JONAS DOWNNEY



Downey is a product designer at Basecamp, co-creator of Hello Weather, an avid writer and pun jokester. He offers us his pick of the month's best websites on page 40.  
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t: @jonasdowney

### MATT CROUCH



Crouch is a software engineer at Vidsy and specialises in React, CSS-in-JS and accessibility. He outlines how you can create reusable components in Storybook on page 82.  
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# CONTENTS

Issue 310 : September 2018 : [net.creativebloq.com](http://net.creativebloq.com)



## ▶ FEED

### SIDE PROJECT 13

**Amit Nambiar** pulls up a chair and shares all on his platform for coding custom furniture

### CLIENTS FROM HELL 14

The latest in our series of nightmare clients

### BEYOND PIXELS 15

How kickboxing stretched **Eloise Ranson's** limits in both life and web development

## ▶ VOICES

### PUT HEALTH BEFORE WEALTH 20

**Michael Gearon** emphasises the importance of tackling stress and illness

### DESIGN FOR CONFRONTATION 22

**David Adkin** explains why it's time to start having some uncomfortable discussions

### CONVERSATIONS 32

**Christopher Murphy** on the benefits of kick-starting a conversation with customers

### Q&A 33

**Bruce Lawson** discusses building at scale and his Generate London talk

### BIG QUESTION 34

Our experts on their attempts to go off the grid and set aside their smartphones

### COUNTERINTUITIVE CRO TRICKS 36

**Sam Nazari** reveals pearls of wisdom unearthed by AI to help convert customers

## \* FEED

### WORKSPACE 16

**> Martin Nixon** shows us around Nixon Design's converted-warehouse studio in Cornwall, adorned with eclectic oddities



## \* VOICES

### INTERVIEW 26

**> Sara Soueidan** on the intersection of front-end development and UX and why it is that she prefers Vue to React



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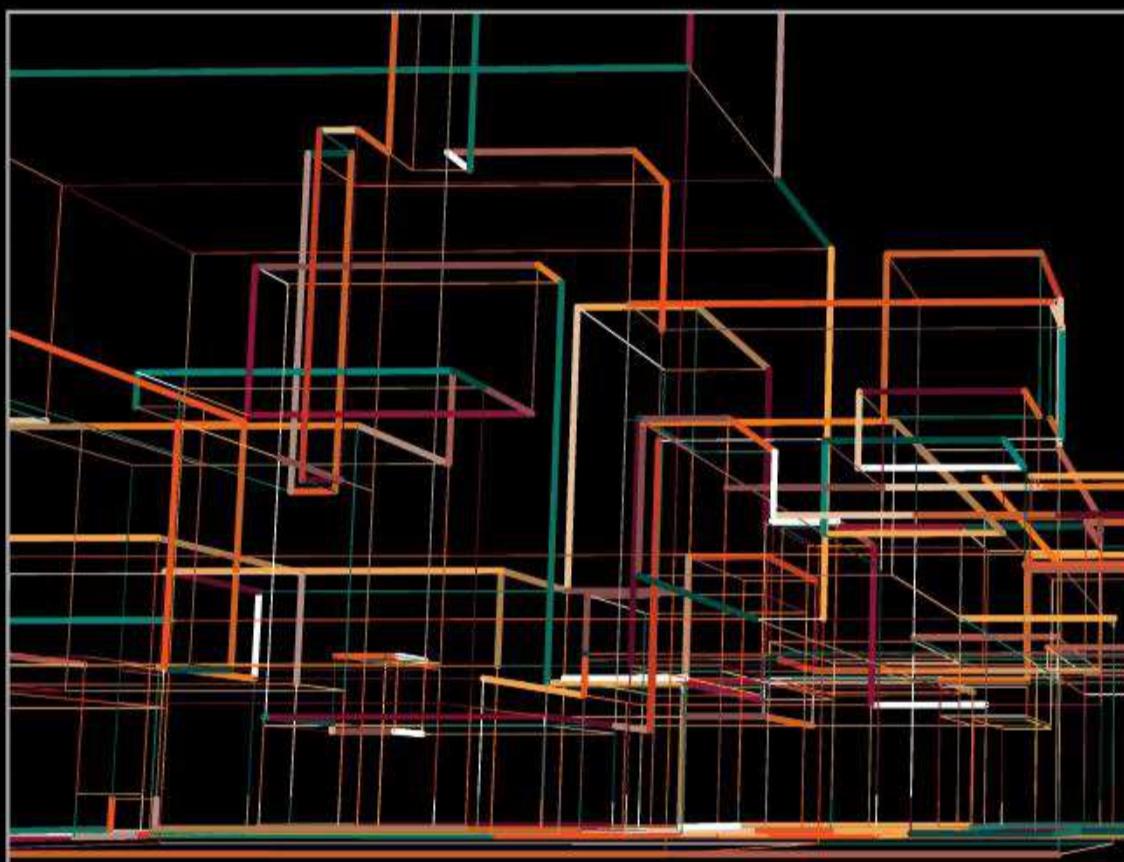
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## FEATURES

### BECOME A UX TESTING EXPERT 60

**Joshua Garity** reveals the procedures you need to follow when it comes to composing effective UX tests

### FIND THE PERFECT FRAMEWORK 68

It's easy to get lost when deciding the best JS library for a job. Luckily, **Burke Holland** will help you find your way



#### \*PROJECT

### CHOREOGRAPH ANIMATION IN INVISION STUDIO 76

**Daniel Schwarz** shows us how to craft advanced animations with InVision Studio's timeline feature

#### \*REGULAR

### GALLERY 40

**> Jonas Downey** runs down his favourite websites of the month, including XOXO 2018's vibrant illustration-led effort

# Contents



## > REGULARS

### EXCHANGE 08

**Ida Aalen** and **Michael Flarup** share their expert advice

## > SHOWCASE

### DESIGN CHALLENGE 46

Three designers offer up the perfect pitch with their websites for a live music venue

### PROFILE 50

**Samuel Honigstein** cut his teeth in Google's lab and is happiest out of his comfort zone

### HOW WE BUILT 56

**The District** explains how it gave a veteran agency an elegant typographic makeover

## > PROJECTS

### USE REUSABLE COMPONENTS 82

**Matt Crouch** shows how Storybook can create resilient UI components

### AVOID THE REACT A11Y TRAP 87

**Benjamin Read** challenges the perception that React supports inaccessible coding

### GRAPHIC SHADERS 88

**Richard Mattka** explores how you can map shader materials to three.js meshes

### TAKE FLIGHT WITH FLUTTER 92

**Simon Jones** on building cross-platform mobile apps with Google's new framework

# EXCHANGE

Send your questions to [netmag@futurenet.com](mailto:netmag@futurenet.com)

Practical  
advice from  
industry experts

## THIS MONTH FEATURING...

### IDA AALEN



Ida Aalen is a Norwegian speaker and writer working in the overlap between user research, UX and content strategy.

She is CPO and co-founder at Confrere, which offers video chat tools tailor-made for professionals who want to meet their clients online.

w: <https://idaaa.no/english-version-who-is-ida-aalen/>

t: @idaaa

### MICHAEL FLARUP



Michael is a Danish designer, entrepreneur and keynote speaker. He loves making things, going on adventures and also telling stories.

w: <http://flarup.co>  
t: @flarup

### ★ QUESTION OF THE MONTH

What's your process for coming up with an icon style for any project that you're working on?

Darshan Gajara, Mumbai, India

MF: My process is largely the same whether I'm designing for myself or for a client: I try to make things I like. So I rarely come up with a 'style'; I just make things that I love and then tweak from there until the client is happy. The style is in that approach.

I often ask the client for references to material when starting a project. This gives me a good idea of what they envision as a successful outcome and it can help me pinpoint a vibe. But I have to trust that the reason they're contacting me is because they've seen some of my work and want me to apply that to their specific challenge.

This actually touches on an important question about being a designer. I don't think we should be expected to produce all manner of styles. As a designer I think it's important to be opinionated and I've learned that a vital side effect of making things that you like is that it generates more work that you'll find enjoyable.



Arcade Trail

A game crowdsourced discovery and curation platform, making it more fun to find your next videogame.



Northplay

Created Northplay, a digital entertainment design studio focusing on games, gamification and making entertaining products.



Apply Pixels

A new type of resource platform with evolving templates and UI kits to supercharge your design workflow and empower designers.

Michael Flarup takes a straightforward approach to icon design: "I just make things that I love and then tweak from there until the client is happy"

## User testing **FAIR TESTS**

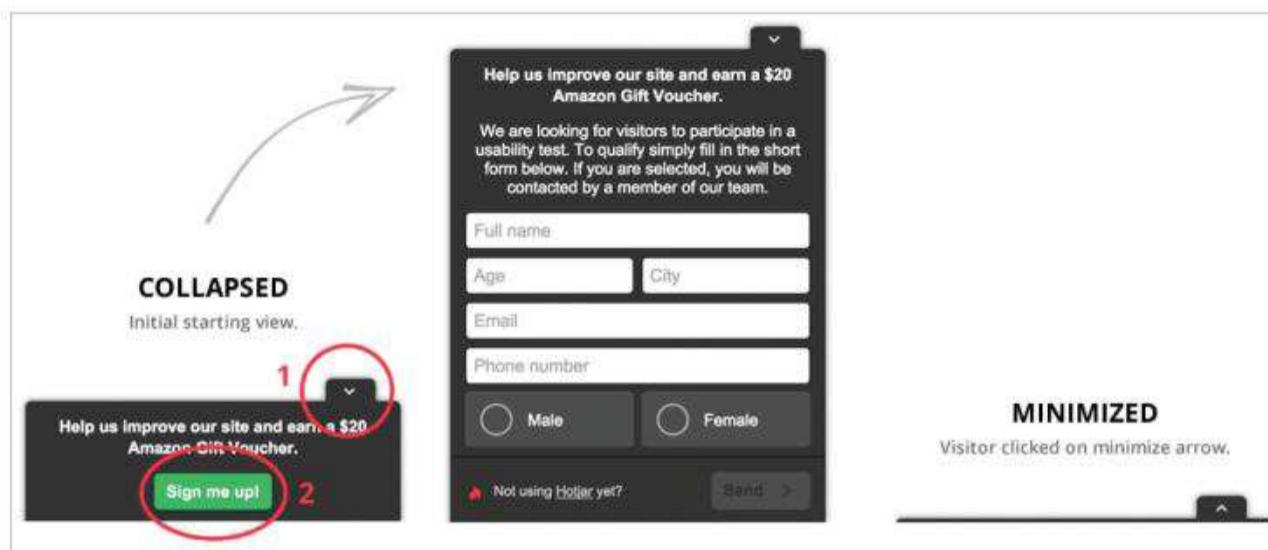
When conducting a user test, how do you ensure you're getting a representative cross section in terms of technical ability?

Chris Smith, Llandrindod Wells, Wales

IA: This is a great aspect to bring into screening and also warm-up questions to give context to the actual user test. First, make sure you figure out what technical abilities are typical for your target group and if there are habits that could represent this. In the screening,

you could ask questions like 'Were you online yesterday?', 'How do you access the internet?', 'Have you used online banking in the last month?' or similar.

I'd consider it more important to recruit users that are from the less tech-savvy end of the spectrum, while still being representative of your target group. In addition, make sure you're not being blinded by stereotypes when recruiting for technical ability. 'Young man' does not mean tech-savvy and 'old woman' does not mean tech-averse.



Hotjar's recruiting forms make it easy to recruit visitors to your website for user testing ([hotjar.com](http://hotjar.com))

## Icon design NO MORE MIMICS?

Do you think skeuomorphism will be coming back any time soon?

**Anh, Hanoi, Vietnam**

MF: I recently wrote an article called 'Bringing Back Skeuomorphic Design'. It was a tongue-in-cheek observation about how tactility and visual design is slowly making its way back into icon and UI design. I never much cared for the term 'skeuomorphic' though.

What I am saying – and what I have always said – is that design can be anything we want it to be. We should strive to make fun and memorable experiences that are appropriate to the context but not arbitrarily restricted. There's a great deal of sameness in design these days and I think we can challenge that if we're willing to let go of some of the minimalist ideals and start thinking about how we can infuse our designs with fun.

Think about form instead of just function. Embellish in the name of orchestrating an experience. Delight as a differentiating factor. If we have to call it skeuomorphic, then so be it.

## User testing LOCATING TESTERS

We find recruitment the hardest part about user testing. How do you go about finding or recruiting users from a diverse set of backgrounds and abilities?

**Ian Routledge, Manchester**

IA: First, try to ask: Where can I go where my users already are? It could

be a pop-up research recruiter form on your website or adding a mention of the upcoming user research in your newsletter or other customer-facing locations. But it's also great to go to a physical location. Does your organisation have physical stores? Could you team up with a local library, internet café or other gathering place where these users would hang out?

## User testing THE MAGIC NUMBER

How many participants should I gather for some lab testing of a single interface/typical website? Is there a minimum I should aim for?

**Octavector, Kent, UK**

IA: The rule of thumb is that you only need to test with five users. This is, however, a simplification. It's based on (binomial) probability and consideration of cost/benefit. With five users you have a good chance (85 per cent) of discovering common problems (ones that affect more than a third of your user group). Even with just three users, you have a good chance at observing common problems. However, for less common problems, you would have to test with 18 users to get to 85 per cent!

This is why the most efficient way to weed out usability problems is to do small and frequent tests, for example three users every month. That way you can also be more confident that the fixes you implement are actually fixes. More details can be found here: <https://measuringu.com/five-users/>

## 3 SIMPLE STEPS

What are your thoughts on rescaling icons? Do icons always have to be pixel-perfect?

**Heidi Helen Pilypas, Adelaide, Australia**



**MF:** Ten years ago, half pixels stuck out like sore spots and we crafted each icon size to meticulous precision. With today's high-res devices, those things are barely visible to the trained eye.

**+** My icon and UI templates at [applypixels.com](http://applypixels.com) increasingly rely on the notion that you just have to create the largest size and then have your design tool automatically scale and export all the smaller sizes. It's convenient and easy but we would have scoffed at the idea all those years ago.



**+** Today, I don't think you need to design every icon at every size. Rescaling is fine because most people can't tell the difference. When I design, I look out for exceptions to that rule and adjust accordingly.

## COOL STUFF WE LEARNED THIS MONTH

### VS CODE CAN DO THAT!?

**+** Did you know Visual Studio Code can refactor your JavaScript to ES6? Or that you can put the sidebar on the right to avoid jiggling your code about? This site is packed with useful tips and tricks that make working with this powerful editor even easier. <https://vscodeandothat.com/>

### ANIMATE CALLIGRAPHY WITH SVG

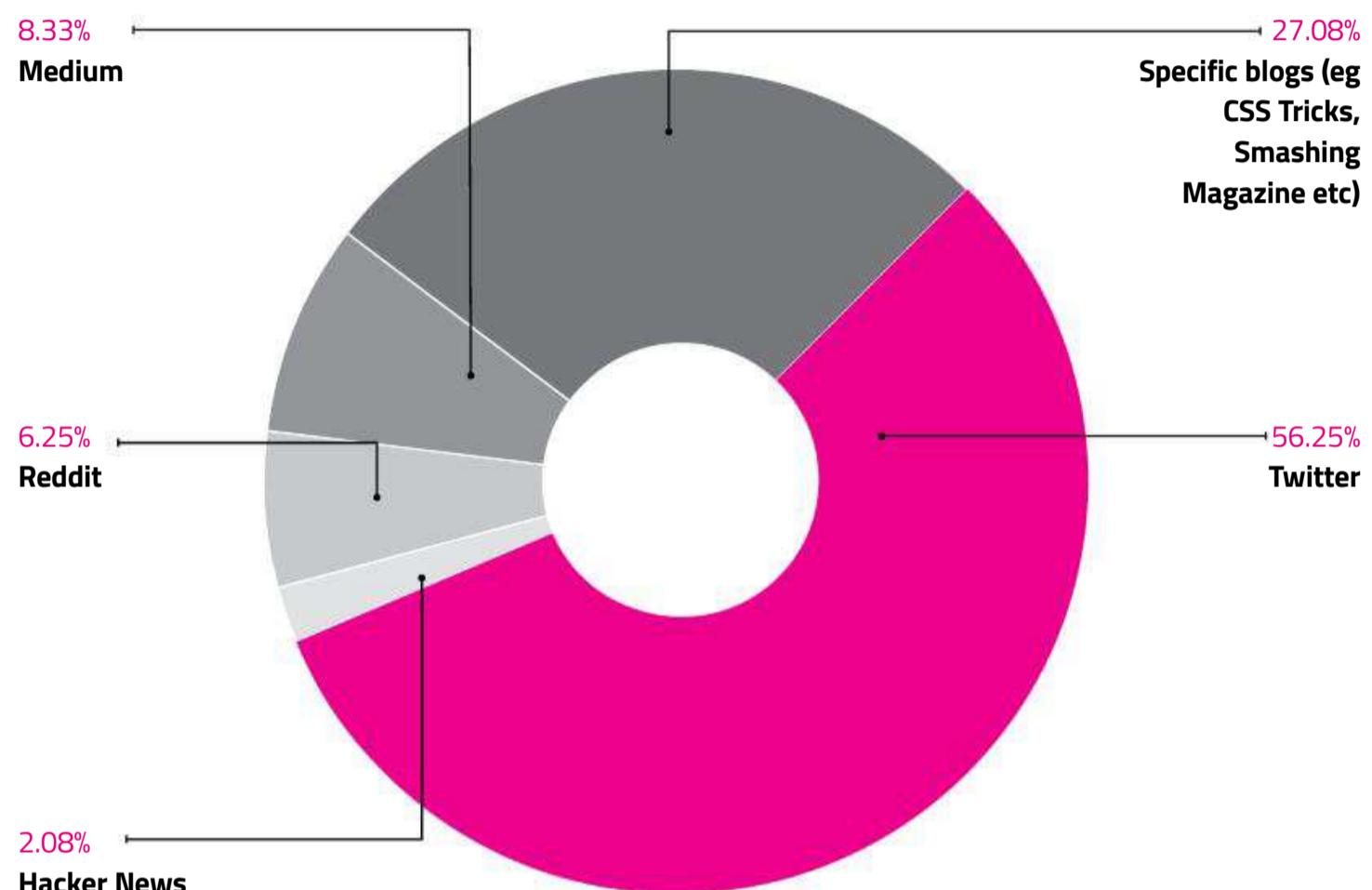
**+** If you've ever tried to animate calligraphy you'll no doubt have discovered that the first step is fairly straightforward but things get trickier when the path crosses itself. Claus Colloseus over at CSS Tricks explains how to overcome this difficulty and create smooth animations. <https://css-tricks.com/animate-calligraphy-with-svg/>

### I DISCOVERED A BROWSER BUG

**+** Jake Archibald accidentally stumbled across a browser bug when he noticed some strange behaviour from a service worker he was playing around with. The bug has now been fixed and in this post he details the interesting forensic investigations he undertook to reveal the security flaw. <https://jakearchibald.com/2018/i-discovered-a-browser-bug/>

### \*THE POLL

# WHERE DO YOU GO FOR YOUR WEB DESIGN NEWS?



## From our timeline

What bad coding practice really grinds your gears?



Copy and paste.  
[@\\_LeonBrown](#)



Agreed! Especially when 'test' class names or whatever aren't changed.  
[@nataliedeweerd](#)



That's another one. Change requests mean that BigRedBox class eventually becomes a small blue triangle. Handy to know how to use naming conventions that will

never change.  
[@\\_LeonBrown](#)



Spaces instead of tabs.  
[@\\_csilverman](#)



Repetition of code because 'it's faster'.  
[@RafAndersson](#)



Ignoring readily available resources. A great way to solve a problem is not having to solve it at all. When in doubt, google it – there's

bound to be someone else in the same situation.

[@davidpottrell](#)



It grinds my gears when people put on blinders to everything except performance when approaching software design decisions. It's not just junior devs making this mistake but senior devs too. Optimising for developer time over processor time is almost always the right answer.

[@ReisnerShawn](#)



Not refactoring once you're finished and leaving a load of unused code and variables.

[@\\_geekjuice](#)

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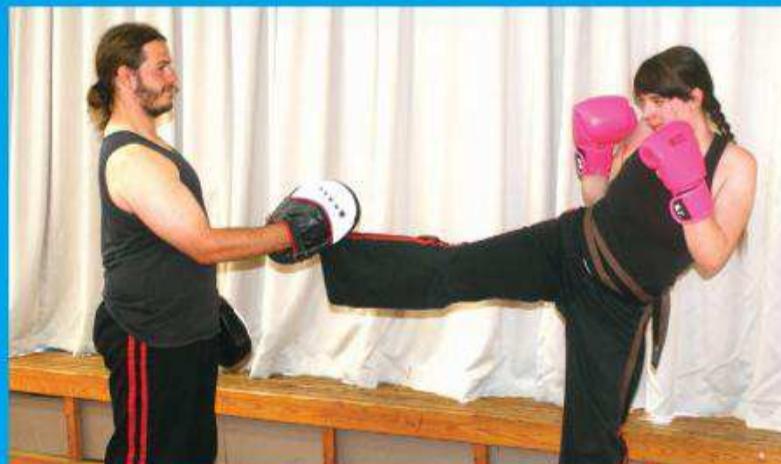
# FEED

People, projects  
& paraphernalia

## THIS MONTH FEATURING...

### CLIENTS FROM HELL 14

This month a web dev finds out that – in the eyes of certain clients – fighting cybercrime doesn't pay



### BEYOND PIXELS

How kickboxing stretched **Eloise Ranson**'s limits in both life and web development

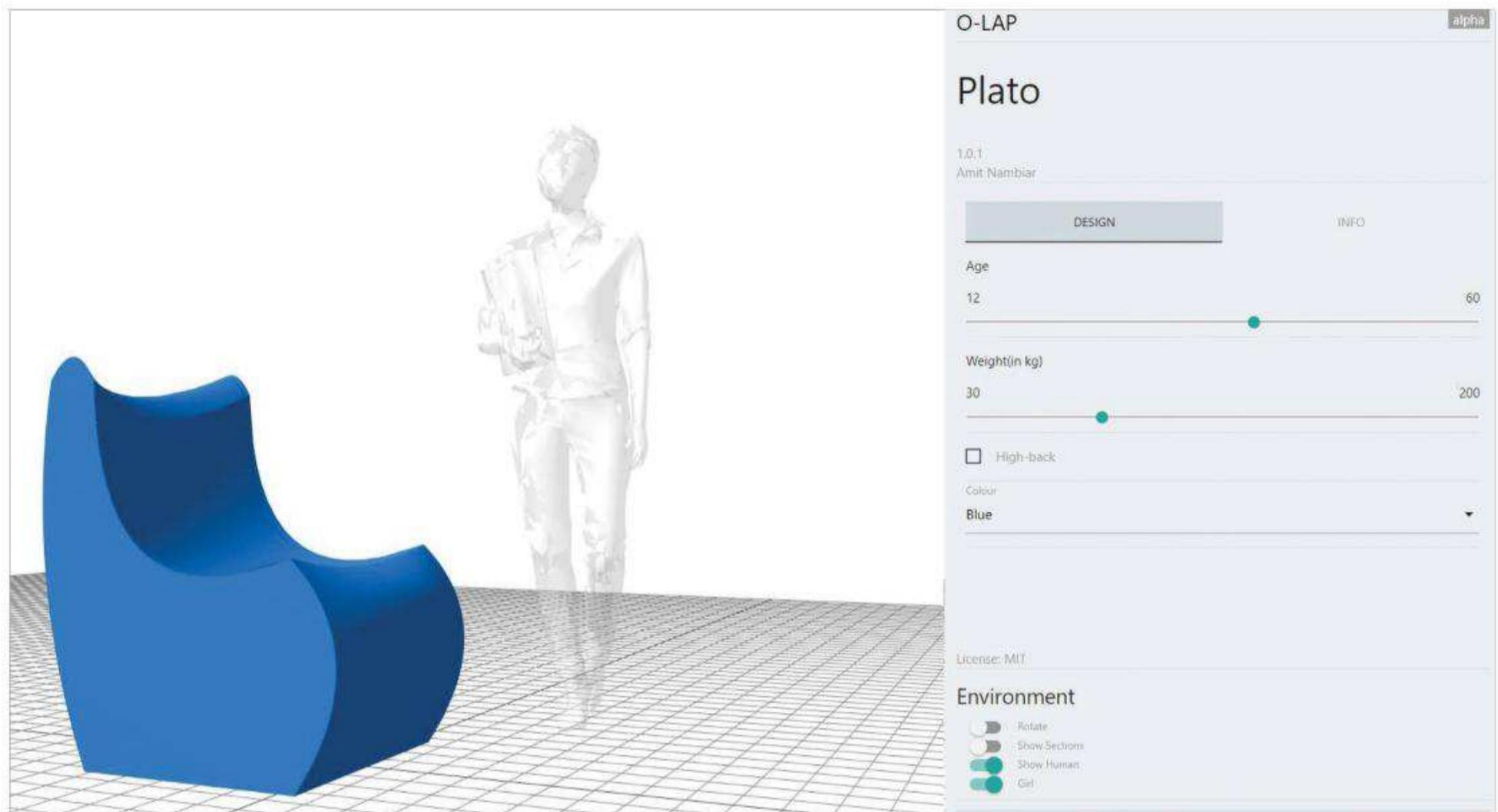
15

### WORKSPACE

**Martin Nixon** shows us around his studio in a converted warehouse adorned with eclectic oddities

16





## O-LAP

**Amit Nambiar** pulls up a chair and shares all on his platform for coding customisable furniture

### \* SIDE PROJECT OF THE MONTH



#### AMIT NAMBIAR

**job:** Architect by training, uses code for design

**w:** [amitnambiar.com](http://amitnambiar.com)

**t:** @NambiarAmit



#### Tell us what your side project does

It is a community of makers who like to make furniture from code. Designers create designs using JavaScript that act as a plugin into a web app. The app is then able to extract drawings from the designs, which can be used to fabricate the design from plywood using a computer-controlled machine (similar to 3D printing). Designers can get creative in different ways when they start writing code to create furniture designs. For example, they can formulate a design for a chair that changes for people according to their different heights or a table that changes the table height as per the age of a person. The possibilities are really endless.

#### Why did you create it?

I studied architecture and was always interested in using code and logic for design.

Around the time I completed my studies I was also looking for furniture, but I didn't really like the kind of furniture available in India. Besides the designs, it

was a lot of trouble dealing with the people I came across in order to try and find some furniture I wanted. I didn't have the means to rent a studio or anything, so this production process was the easiest way for me to make my own furniture.

#### What were you hoping to achieve?

I was frustrated with furniture buying and my main idea was to help myself. But as I went about doing that, I realised the possibilities and that's when I got together with some friends and started doing this. We sold a bunch of chairs to our friends and also online in India. It was doing well and we felt it was an idea that needs more attention.

#### What are you planning to do with it?

I'm keen to connect with more designers and makers who are interested in the idea of distributed decentralised designing and making. I think it's a really practical idea for people everywhere because it can shift the task of making and designing furniture from a few individuals and companies over to a community of makers and designers. I'm talking with some people who believe in this vision and that's about all even I know at this point.

The design also needs work, particularly when it comes to upholstery, so I'm looking to connect with someone who would be interested in the idea and who can aid the design process for that. ■



\* HOW TO

## WRITE MAINTAINABLE CODE

It's always interesting how something that looks self-explanatory just after you wrote it can seem totally incomprehensible a mere week or so later. We asked the @netmag followers what they do to make sure their code is understandable to their future selves and others.

### ENCAPSULATION AND GOOD COMMENTING

"I write code thinking I'll want to delete it in six months, so I encapsulate it as much as possible," says @ailin10.

@thefuzzpedal has this advice:

"Write meaningful commit messages; keep a consistent coding style; write comments especially in complex areas of code – you will not remember what that lambda does!"

### STREAMLINE YOUR CODEBASE

"Avoid leaky abstractions. Choose established libraries with a large user base and good documentation. Remove dead code. Remove living code. Remove entire features. Say no to features before you even begin building them," says @bjorn\_js.

### THINK OF HOW ANGRY PEOPLE WILL BE

@CMRDove recommends keeping this old adage in mind: "Always code as if the person who ends up maintaining your code is a violent psychopath who knows where you live' and try to keep it as decoupled as possible".



## HACK PAY

**Exclusively for net:** The latest in a series of anonymous accounts of nightmare clients

\* CLIENTS FROM HELL

I'd built a website for a client who kept asking for countless revisions and didn't really respect my time. However, I still agreed to take on website maintenance for them. While waiting for them to sign a contract, I started to receive notifications of unauthorised changes to the site and noticed I could no longer log in – the site was being hacked. I quickly took steps to block the attack. I notified my client of the unauthorised access, as well as all the steps I took to mitigate it. I also sent them an invoice for the work and a reminder to sign the contract.

After another three reminders, they contacted me:

Client: Thank you for your work but we're hiring an in-house developer.

Me: Fine.

Two hours later, they sent a new request:

Client: Hey, can you update the URL for two links on the site?

Me: Umm... No. Not unless you sign this one-time maintenance agreement and pay the invoice for all the work that I already did.

Client: This shouldn't take but 10 minutes to do, right? Will you take \$10?

Me: Let me get this straight. You're reaching out to me so I can do work for you for practically nothing, after I spent four hours you haven't paid for yet saving your butts from a malicious attack. You've ignored multiple invoices and now think I will jump at the chance to do work for practically nothing.

Client: Yes?

Me: Only if you pay my outstanding invoices and sign a new contract.

Client: For \$10, right?

Me: ...

The next day, I found out the 'in-house developer' was an Indian firm they hired and gave credentials to before they paid me and closed my contract, thereby breaching an exclusivity clause. Goodbye and good riddance.

**CLIENTS FROM HELL**  
[clientsfromhell.net](http://clientsfromhell.net)

# KICKBOXING

Confidence, communication and kicks: how kickboxing stretched Eloise Ranson's limits in life and development

## \* BEYOND PIXELS

**>** Just like web design and development, kickboxing is something I always knew I wanted to do. I had those 'Aha' moments – the sudden realisation this was going to be a big part of my life. Both were callings and they hit me like a well, punch in the face!

After eight years, I'm taking my black belt grading. I was never a patient person but kickboxing gave me a long-term goal and showed me how much can be achieved when improving skills over time. With anything you love and do often enough, at times it feels like a grind. But you power through and, eventually, you solve a problem or do something a bit differently. You move up to the next level and it feels great.

The health benefits of kickboxing are obvious. It gets me moving, which is so important when spending hours sat down behind a screen. But also mentally. It can be quite easy in our industry to become introvert. We're inside all day, on the computer for hours, communicating via email. Kickboxing gets me out the house and socialising.

I've made good friends, seen classmates marry and also met my boyfriend there. My kickboxing club feels like an extra family. A cool bonus is that my teacher's also a developer, which is handy if I want to chat through a dev issue. I strongly advise

anyone to join a club, whether that's cooking, reading, tennis, whatever you enjoy. Human interaction is important and we can easily lose that hiding behind a computer, so meeting a group regularly can be really beneficial.

I loved learning to code so much when I was younger. You could never get me off the computer! But because of this, I neglected my social skills and developed anxiety so badly that I couldn't go to the shops or talk to someone I didn't know. Kickboxing greatly improved my communication, as over the years I've had to explain techniques to lots of people. I truly believe communication is the key to a good client (if not every) relationship. Not to mention the confidence it gives you. Throwing a good punch or kick – how can you not be confident after that?

Kickboxing has forced me to overcome physical and mental barriers and I'm really excited for the next stage after my black belt. I've learnt the rules – now it's time to break them. ■

\* PROFILE



Eloise is a freelance web designer and developer at [thisiseloise.co.uk](http://thisiseloise.co.uk). Often described as a website whisperer and WordPress wizard.



## STUFF I LIKE



### TIM BREEZE

Graphic designer and front-end developer

<https://tim-breeze.com/>

### FIGMA

Over the past year, Figma has become my go-to design tool. It just does everything I want and boy does it do it fast. It's revolutionised not only the way I design but the way I collect client feedback and present my designs. I simply love it.

<https://www.figma.com>

### MUZLI

This handy little Chrome extension replaces every new tab with a curated list of, mostly, design news. You can tailor it how you like and I find it's a great way to start the day – whether that's checking the latest shots on Dribbble or threads on Designer News.

<https://muz.li>

### TANIA RASCIA

Tania writes the most effective tutorials I've ever read. Her blog is a great source of guides for a wide range of web development topics, tools and languages. It's a pleasure to stumble across them whenever I'm stuck on a project.

<https://www.taniarascia.com>



## MARTIN NIXON

**Martin Nixon** shows us around Nixon Design's converted-warehouse studio in Cornwall, adorned with eclectic oddities

### \* WORKSPACE

My wife Emily and I bought White's Warehouse, a beautiful three-storey Victorian building, in Hayle 12 years ago. We spent two years restoring it from a wreck into a home for my branding agency Nixon Design and her jewellery studio. It's a five-minute walk to the beach and the RSPB reserve, where you can spot spoonbills and herons or forage wild samphire. With an office in London and top-notch connectivity, we can enjoy the Cornish lifestyle yet work with clients countrywide.

We're on the top floor, where there's a high-vaulted ceiling supported by the original wooden trusses – plenty of space for thinking. Natural light floods in from the large arch window and

the three-metre-squared skylight, curtained by a yacht's sail that you can hoist up and down.

The studio's scattered with old knickknacks and oddities I've collected over the years. For us, having a space that reflects our brand puts the team in the right mindset. It's also an important way to attract new blood and we're always on the lookout for talent. My most treasured pieces are the red neon letters from a Woolworths sign (1), which my wife bought from the workers dismantling the Penzance store. They're a humbling reminder that even iconic brands are mortal.

Over on our bar is another iconic logo: a super-rare papier mâché Austin 'Flying A' sign (2) used in showrooms back in the day and

sourced by my twin brother, who has a great eye for these things.

Up on the windowsill we have our book-share (3) where we can all swap our favourite titles. It adds an extra dimension to the workplace and helps to get the whole team – developers, designers, copywriters and project managers – talking and sharing ideas.

They can do this in the lounge area (4), a great place to huddle around the coffee table and snack on fresh fruit or sort information architecture cards. It's also a fine spot to settle into an armchair with a laptop, take a break from your desk for a new perspective.

The tin ingot (5) on the coffee table hails from Hayle, which in my view should be considered the Silicon Valley of the 18th century. This town was home to Harvey & Co, which exported state-of-the art Cornish steam engines all over the world. It keeps me aiming high. ■

**PROFILE**  
*Martin Nixon founded Nixon Design back in 1992 and now heads up the full-service branding agency as managing director*  
**w:** nixondesign.com

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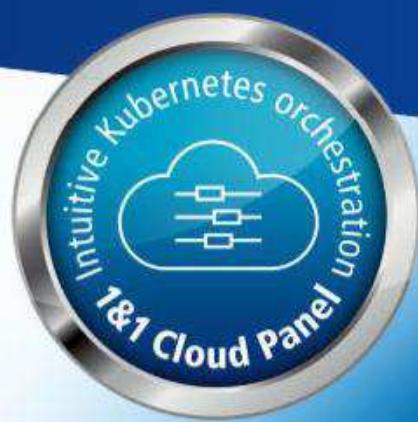
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# VOICES

Opinions, thoughts & advice



## ESSAY

22

**David Adkin** explains why it's time to start having some uncomfortable conversations



## INTERVIEW

26

**Sara Soueidan** on where UX meets front-end development, why she prefers Vue to React and how she ups her productivity with rope jumping



## Q&A

33

The well-known speaker and accessibility evangelist **Bruce Lawson** discusses building at scale and his Generate London talk

\* WELL-BEING

## PUTTING HEALTH BEFORE WEALTH

GoCompare's **Michael Gearon** emphasises the importance of tackling stress and illness

Work and stress can lead to depression, anxiety and illness. In my case, stress three years ago may have been one of the factors that caused me to be diagnosed with ulcerative colitis. After being in and out of hospital while trying to establish my career, I have learnt painful lessons on how to manage stress.

### OPEN UP

First of all, the best thing to do is start talking. If you're comfortable doing so, open up to your family, friends and colleagues. These are the people you spend most of your time with, so it'll be helpful for both of you to understand what you're going through. My partner and I talked about my illness regularly and it helped us get through it together. Crohn's and colitis can be difficult to talk about, even with family, but there are more than 300,000 people that are affected by it, so just remember you are not alone.



## IT BEGINS AT HOME

We're all guilty of spending a bit too much time on our phones or in front of the TV but ensure you take some time to unwind. Getting a good night's sleep not only helps keep you healthy and well rested, it can also help you deal with stress. Simple tasks like keeping on top of bills, mowing the grass or fixing that leaking tap can improve your well-being.

## DON'T PUSH IT

Exhaustion is one of the main issues that some people with Crohn's and colitis suffer from. You're not invincible and while the occasional midnight flurry of coding isn't serious, don't make it a habit. Always think: 'what's the worst that's going to happen while I have a few hours of sleep?' Your health is more important than an extra line of code.

## FOCUS

Don't feel like you have to tackle everything in one go; prioritise items that will make a difference to your life and your career. It's better to do half of your tasks and do them well, instead of half-completing everything. Personally, I have been focusing on finding medication to keep my disease under control. Now I'm on something that works, I can turn my attention to my career.

## YOU'RE NOT INVINCIBLE

Discuss your illness with the person or team that deals with your welfare at work. If you need time off for your mental or physical health, then take it. There's no shame in illness. Returning to work after an illness could mean that you encourage positive policy changes within your company. It also places you in a position to help establish new support networks and channel a safe place for health-related discussions.

## TAKE A BREAK

Often in our industry, going the extra mile all the time is seen as important. It isn't. Most of the time putting in more hours causes more problems than it solves. Instead of working flat out, learn a new skill, take a stroll around your local

park during your lunch break or help someone else. This will improve your creativity, productivity and help you get your tasks done more efficiently.

## COMMUTE WITHOUT STRESS

The commute to work can often be quite stressful, whether that's because of ridiculous traffic or delayed public transport, but it doesn't have to be. Often there's nothing you can do about it, so make the time yours by listening to a playlist of your favourite songs, a podcast that inspires you or read a book you love. Use the time to prepare yourself for the day ahead or unwind as you travel home.

## AVOID ESCALATION

Take a note of the situations that cause stress and how you react to them. Some people recommend keeping a stress diary but not everybody has the time or commitment to do that. The main thing is to just be aware of what makes you stressed and how to turn the negative into something more manageable. Self-awareness is key.

## YOU DEFINE YOURSELF

One of the toughest illness-related issues was understanding that I have it for life. When I was first told about it, I didn't understand what the consequences were and how much of an impact it would have. Now I have taken a new view on my colitis: it won't change me. I decided that my colitis won't prevent me from achieving my goals and it won't limit my ambitions. The only restrictions my illness gave me were the ones I put upon myself.

## HEALTH IS MORE IMPORTANT

If you focus on your health first, your career will follow. If you don't feel well, your work isn't going to be on top form either. Putting in ridiculous hours or working every weekend isn't critical to success. The key is to prioritise your illness and focus on things that will positively impact you and your career. ■

PROFILE  
\*

Michael Gearon is a product designer at GoCompare, specialising in optimisation and user testing.



\* WEB DESIGN

# SUCCESSFUL INNOVATORS DESIGN FOR CONFRONTATION

Illustration by Kym Winters

**David Adkin** explains why it's time to start having some uncomfortable conversations

As designers, innovators and entrepreneurs, our mission is always to make people's lives better. Everything we create is pitched the same way – 'Hey, what you're currently doing is painful; here's an easier way'. So when Steve Selzer, a designer manager at Airbnb, suggested at SXSW that 'making things easier' isn't always a good idea, I did a double take.

To make his point – that there are unintended consequences to removing all effort from every experience – Steve brought up *WALL·E*, a movie where everyone's strapped to a motorised chair and eventually unable to see past a screen in front of them. In our world, our desire for everything to be instantaneously easy has caused us to shy away from facing anything tough. But challenges are how we grow. Steve's solution is to design for confrontation; not only with our customers but our colleagues and even ourselves.

It was a powerful message, made even more powerful by what followed. Next up was a talk by the billionaire hedge fund manager Ray Dalio. I figured that he would provide a totally fresh perspective on design. Well, I was wrong. He too focused on the importance of confrontation and the power of thoughtful disagreement. These concepts are so core to his organisation that they film every meeting so disagreements are public and confrontation is encouraged.

After hearing both of these talks, I was fired up! I was ready to confront anyone! But as my adrenaline lowered, I remembered a challenging (and confrontational) audience question from Steve's talk: 'It's easy for you to

confront others. You're the boss. You don't have to worry about getting fired. What about the rest of us?'

And it's true; both Steve and Ray are in positions of power. How many of us could get the buy-in to record and publish every office meeting? My doubts began to grow. Can only leaders design for confrontation?

Then I started thinking about my own experiences. I realised that I've done this in small, less risky ways and that I could do it far more. I decided to list out what I've done to encourage confrontation and what I'm still too afraid to try.

## CONFRONT YOUR CONSCIENCE

**Nothing is stopping you from confronting yourself**

**Low risk:** Confront your known weaknesses. Maybe – like me – you spend too much time on social media. Or maybe – like me – you're not good at writing the copy for your interfaces. Fortunately, we can design systems to confront these weaknesses. For my social media addiction, I compartmentalise my devices. I use my iPad solely for reading articles and sketching and, when I'm working, I put my phone in my backpack. To improve my copywriting skillz, I force myself to use actual words in my sketches. You'd be surprised just how much the design improves when your words are more than just random squiggly lines.

**Medium risk:** Uncover unknown weaknesses. Here, we can take a page out of Ray Dalio's book, *Principles*, and write down every mistake we make. When I started working, I created a Google Doc titled 'Never Make These ►

- Mistakes Again' and I add to it every time I mess up. This process has revealed weaknesses I didn't know I had. I've also found a trusted co-worker to point out mistakes and help me avoid them in the future.

**High risk:** Confront your personal purpose. Research shows that the more passionate you are, the better your designs will be. The scary thing is that for most of us, our creative purpose doesn't always match our organisation. Discerning your creative purpose is like opening Pandora's box. You might be happy where you are but if you find your organisation doesn't align with your purpose, you might want to start looking for something new.

## CONFRONT YOUR COLLEAGUES

*This can get awkward*

**Low risk:** Create a confrontation plan. Good design processes encourage differing opinions but sometimes this leads to lingering tension. A clear process solves this. At my company, we 'pull the cord' in a methodology derived from Toyota's production process. Anyone can pull the cord to stop the project if they see a problem.

service for true confrontation. The only real experience I have here is pushing back on feature requests and requirements that I think are bad for our customers. However, Steve Selzer suggests going further like how Nintendo confronted gamers in Wii Sports. After a few hours of play, the game pauses with an image of an open window, asking 'Why not take a break?' There is no denying that confronting your customers is scary but if you've got their best interests at heart, they'll respect you for it.

**High risk:** Define your purpose. The final and riskiest way to confront our customers is by clearly defining our organisation's purpose and principles. Today's world is more connected and politicised than ever before. As a result, many organisations are having to make tough choices like Dick's Sporting Goods' decision to stop selling assault rifles, Patagonia's decision to sue the White House and Delta's \$40 million decision to end a discount for 13 passengers. While not all of us have to make such high-profile decisions, it's still crucial to define our organisation's principles so everyone's on the same page when these issues arise.

**"Every week, find time to talk to someone you've disagreed with... these conversations prevent conflicts from lingering and escalating"**

Once the cord is pulled, everyone involved has to work out the issue together.

**Medium risk:** Hold regular retrospectives. Retrospectives are team meetings to talk about what's going well and what could be better. Involving everyone is an easy way to confront an issue without confronting an individual.

**High risk:** Conduct what Airbnb calls 'real talk.' Every week, find time to talk to someone you've disagreed with. Doing this weekly means the event is fresh enough to remember the details but not so fresh that it's emotional. These conversations prevent conflicts from lingering and escalating.

## CONFRONT YOUR CUSTOMERS

*The most challenging of all; upset customers are bad for business in the short term*

**Low risk:** Tout best practices and good habits. Content marketing is a low-stakes way to confront your customers. My organisation does a great job of advising our customers not to use our products in ways that aren't in their best interest. This enables us to confront the issue while still giving our customers options.

**Medium risk:** Suggest they stop. It's one thing to write an article but it's another to change your product or

## IT'S CONFRONTATION TIME

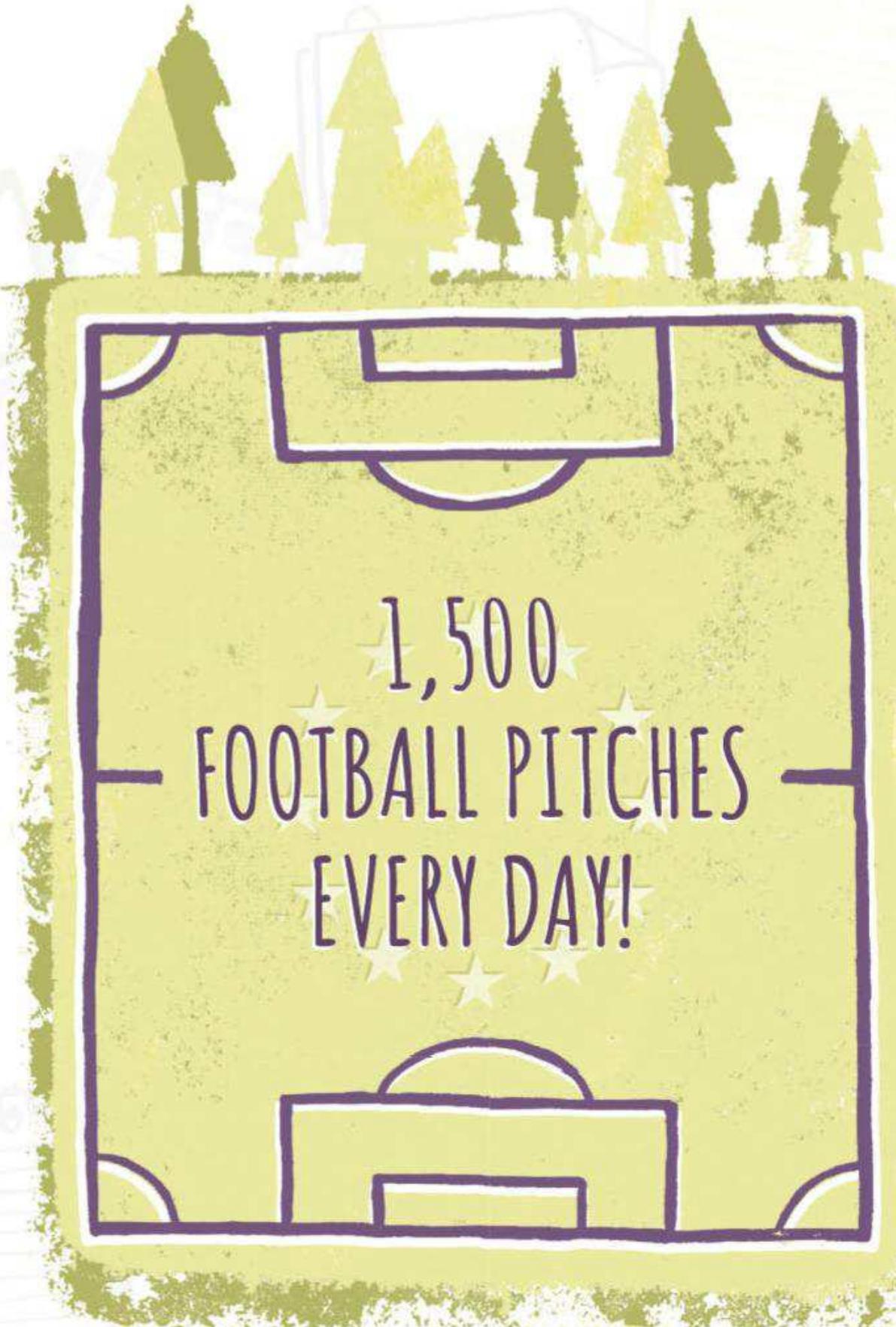
I've given you some examples of designing confrontation in your life, your workplace and your product – but now it's my turn to confront you. I'd like to challenge each of you to confront your conscience, your colleagues or your customers. If you're skittish, start with the low-risk ideas. If you're feeling bullish, swing for the fences and demand your organisation define its principles and challenge your customers.

While confrontation might seem like a scary stance for you to adopt, doing nothing may actually be riskier in the end. Not confronting the problems you see today can make those issues much worse in the future. And while this all might sound really difficult – that's kind of the point. Just remember, as Tim Ferris says: "A person's success in life can usually be measured by the number of uncomfortable conversations he or she is willing to have." ■

PROFILE  
★



David's on a quest for a practical process that anyone can follow. Join him at [innovateeverything.io](http://innovateeverything.io) and on Twitter @david\_adkin.



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## Sara Soueidan

Words by Oliver Lindberg Photography Sara Soueidan

Ahead of her workshop and keynote at Generate London, we chat to Sara Soueidan about the intersection of front-end development and UX, why it is that she prefers Vue to React and how she works on boosting her productivity with rope jumping

 INFO

**job:** Freelance front-end UI/UX developer

**w:** [sarasoueidan.com](http://sarasoueidan.com)

**t:** @SaraSoueidan

There aren't many speakers in our industry whose passion for front-end development is as infectious as Sara Soueidan's: her workshops and talks are so crammed with advice, not least because of the dizzying speed she delivers them, that they regularly leave attendees with their minds blown. The impressive words-per-second ratio even prompted one delegate to tweet how amazing it would be if Soueidan and Eminem competed in a rap battle.

Best known for her outstanding work around CSS and SVG (her SVG workshop, in fact, is her most popular one), Soueidan has been developing a new workshop, set to debut at Generate London in September, that is focused on designing and creating universal UI components.

"A while ago Zach Leatherman retweeted someone who was asking for dependency-less Vanilla JavaScript components," Soueidan remembers. "Zach said that it would be really nice if we had a universal components repository, so I searched the word 'universal' and came up with this definition: a universal component is a reusable component and contributes to and enhances the overall user experience of the interface. It's accessible and embraces best practices in terms of UX

design and code. Ideally it has no dependencies whenever and wherever possible and can be plugged into any or many environments and contexts."

Universal components don't require a specific setup or JavaScript frameworks, which Soueidan always tries to avoid, unless they're absolutely necessary. Each component has its own UX considerations. By way of an example, Soueidan points to an article by Eric Bailey on Smashing Magazine that she's just read, in which he explains why you shouldn't be using the placeholder attribute (<https://www.smashingmagazine.com/2018/06/placeholder-attribute>). "That's a fantastic example of the things that I'm going to be covering in the workshop," she enthuses. "It's best practice to not use a placeholder when you're creating input fields because it has a lot of accessibility and UI design problems. So if you're going to ditch placeholders, you're going to have to provide a more accessible solution."

Soueidan plans to do exactly that with every single component she has time to cover during the workshop (this includes buttons, mobile interactions, navigation systems, tool tips and accordions). Attendees will explore everything from the UX decision-making

process to building the component with markup, semantics and accessibility in mind. "I recommend [you] start testing for accessibility on a component level whenever possible. Don't wait until you've built the entire user interface and then start testing. When you break things down into smaller parts, you get better results and it doesn't feel that it's a big burden."

One of Soueidan's favourite components is the form, which she loves styling with SVG, specifically checkboxes and radio buttons. The typical way to style them would be using a PNG sprite, which is something that requires an extra HTTP request, or CSS pseudo-elements, meaning it requires writing a lot more CSS. Soueidan, however, recommends using SVG. "Add an SVG path – which would be inlined in the HTML – then when the box is checked, animate it using the line-drawing technique and combine it with the sibling selector in CSS. It provides a really nifty animation when the user interacts with the checkbox and requires only inlining a very small SVG in your HTML – no extra HTTP request and one line of CSS. It's visually more appealing as well!"

She loves using SVG in unconventional ways, for example to replace CSS features that don't have enough browser support. An example of this is the object-fit property, which defines how an element responds to the height and width of its content box and enables you to crop and scale images by giving control over how it squishes and stretches inside its box. "If you need to support any version of Internet Explorer, it's not going to work," Soueidan warns. "But with SVG, you can use the most powerful attributes: the viewBox attribute and the preserveAspectRatio attribute, my absolute favourites. They can be used to get exactly the same result as object-fit but instead of using CSS, you use SVG and get browser support all the way back to IE9."

These kinds of tips just burst out of her, yet Soueidan says the more she works with CSS and SVG, the more she struggles to differentiate between what's common practice and what are novel techniques of her own creation. This means she doesn't always recognise how useful they could be to other developers. "A lot of the things that I use in my workflow and take for granted are still new and would count as really nifty

Photo: Drew McLellan





tricks to someone else but I'm really bad at identifying them. I just have too many."

As you can probably surmise, Soueidan isn't one to add trendy new frameworks to her workflow without being sure they'll boost a site's efficiency. Whenever a new feature is released she doesn't dig right in but first tries to get a broad overview to determine if it's going to help her in her work. She was well aware of both Vue and React about a year ago but only started really learning one of them when she decided that she needed a JavaScript framework, both for client and personal projects. "I chose Vue because it's much more approachable and closer to my mindset," she explains. "The paradigm shift isn't as strong as it is with React. I just can't get my brain to think in the React way, whereas Vue is a lot closer to my way of thinking."

Soueidan also doesn't like the way React is being used, which prompted her to tweet that React is the new jQuery, a widely misunderstood statement. "Some people thought that I was hating on React but I

definitely didn't mean it in that way," she clarifies. "React seems to be becoming the go-to choice when building components for a lot of developers, even when it's overkill and completely unnecessary. This is similar to when everyone used to plug jQuery into all of their projects, even though Vanilla

**"I chose Vue because it's much more approachable and closer to my mindset. I just can't get my brain to think in the React way"**

JavaScript or even just CSS was more than enough for the task. I just don't like the misuse of it."

Front-end developers are increasingly needing to make these kinds of considerations in their work: adding bells and whistles has to come second to great user experience.

Developers are getting to improve on the user interface and the UX design with their work, for example by reminding the designer to use proper focus styles and requesting to ensure the interface works for keyboard users. Or by making a site work offline with features like service workers (which Soueidan highly recommends everyone tries to do, as it's much simpler than anyone might think). This is why Soueidan has added the term 'UX' to her job title, which may be a little unusual for a front-end developer but for somebody who works at the intersection of both disciplines, it makes perfect sense.

The decision was inspired by Paul Boag's article, Why you Should Want to be a User Experience Developer (<https://boagworld.com/dev/why-you-should-want-to-be-a-user-experience-developer/>). "Paul talks about how a front-end developer plays a major role in making or breaking the user experience," Soueidan explains, "and that it falls to them to make the page load faster, have proper semantics in place and ARIA roles wherever needed." The article resonated with ►



“Refusing to use markup and JavaScript and favouring CSS-only solutions can break the accessibility of the interface”



► Soueidan's idea of her job responsibilities and what she works on with her clients.

Now the user experience consultancy Soueidan provides comes as a (free) extra with her front-end development work. It's her job as a developer, she argues, to make responsible decisions and not to focus on CSS-only solutions when you should be using semantic markup. "I've seen too many cases of UI interactions that are not accessible. Sometimes you need ARIA roles for a component to behave correctly and work with screen readers. Refusing to use markup and JavaScript and favouring CSS-only solutions can break the accessibility of the interface and therefore affect the overall user experience in a negative way."

In light of her UX expertise and her focus on promoting more efficient code, it's no surprise the Lebanon-based front-end developer is a sought-after speaker and workshop host around the world – at conferences and in-house at companies like Netflix. She's also had some high-profile client work, including the front-end

foundation for Smashing Magazine's recent redesign. In the past her busy schedule has led to burnout but she's learned to prevent it by not working as much as she used to, prioritising and only accepting opportunities that align with her personal goals. She now works four to six hours a day on average, depending on the projects and deadlines. Her most productive time is early in the morning. "I get up around 5am for the morning prayer and spend about an hour not doing anything computer-related but then, between 6am and 9am, my brain is on fire. None of my clients are awake at this time, I don't use Twitter and remove all distractions."

To increase her productivity Soueidan takes a lot of breaks. "Every time I scratch off one task on my to-do list, I reward myself by getting up and doing a light exercise – maybe it's 10 burpees or five to 10 minutes of rope jumping. It allows me to keep up my energy physically and mentally." She tries to balance her time between 50 per cent at her desk and 50 per cent outside, which can include going for a drive or cooking. Or

recording a different kind of webinar with Smashing Magazine's Vitaly Friedman, The Pizza Show, which covers everything but work – recent recipes they've discovered, places they've visited, things they've learned that aren't related to work.

So what's next? Soueidan has a surprise up her sleeve. "I'm working on something extremely exciting with someone really big in the community. I can't tell you much but let's just say that we're going to be building useful things for people." ■

*Sara Soueidan will be speaking on 'Front-end meets UX: designing & creating universal UI components' and 'Using CSS (and SVG) for the good of UX' at Generate Conference London, which takes place between 19 and 21 September. For details and to buy tickets, see <https://www.generateconf.com/london>*



\* THE DESIGN OF BUSINESS

# CONVERSATIONS

**Christopher Murphy** highlights the benefits of kick-starting a conversation with your customers



**job:** Writer, designer and educator  
**w:** [tinybooks.org](http://tinybooks.org)  
**t:** @fehler

In an increasingly connected world, the opportunities to spark conversations with your customers are extensive and, to a large degree, unprecedented. In an age of often faceless brands, the businesses that engage in dialogue with their customers stand out from the crowd.

Communication that used to be one-way in the age of broadcast media has now become two-way in the age of conversational media. This shift, which has seen customers become active participants with brands via social media, has fundamentally altered the dialogue that exists around products.

Sharing stories and showcasing products in use via social channels enables other potential customers to gain an insight into your products or services, helping them to see the stories that lie behind them.

As a small business your customers have an opportunity to deal directly with you and, by starting a dialogue with them, you can share the stories they share with you as a core part of your marketing strategy. These shared stories are the glue between a business, its products and its customers (both existing and future customers).

When your product arrives at its new home, its story is only just beginning. By encouraging your customers to share its story, you showcase your

product in a manner that's infinitely more relatable than a product image on your website.

This 'window into your product's world' moves it from an abstract environment, locked within a web page, into a real environment, allowing your customers to see it as a part of their lives. That shift makes all the difference to the bottom line.

## #HASHTAGS

Hashtags can be a powerful business tool. Gathering stories around a shared hashtag enables businesses to open a dialogue with customers, including them in their mission and purpose.

Of course hashtags aid discovery, letting others who might not be aware of your product find you, but they can – equally importantly – encourage and continue conversations around specific themes. Hashtags coalesce stories, igniting a thriving conversational dynamic and helping customers feel a connection with the business.

Enrich & Endure – a brother and sister duo based in Northern Ireland who create beautiful linen aprons – embraces this approach of using hashtags to great effect. Its hashtag #apronsinaction allows customers to share photographs of their aprons in action, enabling them to become an integral part of the company's story.

The result is a series of images that capture the lovingly designed aprons in their 'natural environments': kitchens, workshops and other fascinating contexts. Featured on the company's Snapshots page ([www.enrichandendure.com/snapshots/](http://www.enrichandendure.com/snapshots/)), these photographs enable you to 'join the journey' of an apron, seeing it as an essential and celebrated part of daily life.

The resulting stories capture the imagination and encourage potential customers to join the journey by picking up an apron of their own. As you embark upon your own business journey, I'd suggest you put some thought into how you might spark conversations with your customers: #startaconversation! ■



Enrich & Endure's Snapshots page showcase #apronsinaction, sharing the company's story



\* Q&amp;A

# BRUCE LAWSON

The well-known speaker and accessibility evangelist on building at scale and his Generate London talk



**job:** Web standards  
lovegod / fashion  
consultant  
**w:** [brucelawson.co.uk](http://brucelawson.co.uk)  
**t:** @brucel

## You're known for speaking up for non-western web users. Why do you feel so passionately about this?

I first discovered the web in Thailand, when I was researching the ramifications of my multiple sclerosis diagnosis. That experience made me understand, early on, that the web isn't just for people based in Silicon Valley or Europe. I've been banging on about that since I returned from Thailand to the UK in 2000 and don't intend on shutting up any time soon.

## How was being a developer advocate for Wix different from your previous role at Opera?

In some ways, it was similar. Both companies had very strong consumer brands and fierce loyalty but weren't well known as places of engineering excellence. With Opera, I worked to show web developers how our engineers made a browser run on low-specced devices to serve its millions of customers in the developing world.

At Wix, I reported directly to one of the founders but he doesn't wander around in a shiny suit of synergies, smoking caviar or swigging leverage beverages; he writes JavaScript in the Stylyable team

([stylyable.io](https://stylyable.io)). It's a very engineering-led company; over 50 per cent of the workforce are engineers.

## What did you learn there?

When I was at Opera I had a somewhat naive view of how websites get made in the industry. Working for Wix, which has 120 million users building sites on its platform, taught me a great deal about building the web at scale, about the kind of infrastructure behind the scenes, performance and where the rubber meets the road in terms of standards.

Wix asked me to join to help them design APIs for Stylyable that are compatible with CSS and other standards and then open-source it. We were open-sourcing a significant number of projects. It was also a great place to work and my team were loads of fun. Who else would fund me to script, direct and appear in a professionally made music video? (<https://www.brucelawson.co.uk/2018/the-making-of-stylyable-the-musical/>)

## Are there any new technologies that are exciting you right now?

Well, naturally, I'm excited about Stylyable. Wix is about to unleash it to millions of users to make their websites with. It offers the benefits of CSS-in-JS (static analysis, components, scoped styles, re-use and customisation) with the advantages of CSS (minimal run-time overhead, familiar syntax, compatibility with existing tooling and performance).

In the wider web standards world, I think web assembly will be tremendously exciting. And Houdini, the ability to hook into the browsers' internal CSS engines and extend or tweak them with JavaScript, will revolutionise both the way we make websites and the way we make standards.

## What will you be talking about at Generate London?

I'll be talking about how to be a proper custodian/steward of the web: making sites that are beautiful and functional, that are open to everyone and making the world a tiny bit better instead of worse. Because if we all contribute a gram of goodness, among the million or so web developers worldwide, that's a whole tonne of goodness produced. And we owe it to the medium that has given us our amazing job. ■

Bruce Lawson will be giving a talk at Generate London, 19–21 September 2018. For more info, visit [www.generateconf.com](http://www.generateconf.com).



★ CAREER ADVICE

# HOW OFTEN DO YOU GO OFF GRID AND IS IT DIFFICULT?

Turning off all your devices can be liberating for the soul but can we actually bring ourselves to do it? Seven creatives share their experiences



DANA JAMES MWANGI

**Branding and website strategist,**  
**Cheers Creative**  
[www.cheerscreative.com](http://www.cheerscreative.com)

 I don't go off grid nearly as much as I should but I am getting better at resting and taking breaks. On the one hand, I really love design and my work makes me excited to jump out of bed. But I've come to learn that part of serving my clients well means that I must engage in more self care, so that I can give them the best 'me'. Every time I rest, I come back sharper and I've also noticed that it's easier for me to retain information and learn something new after taking a good vacation.



JOE RUTLAND

**Freelance UI designer**  
[joerutland.com](http://joerutland.com)

 After going freelance in 2016, I could never switch off. Wherever I was, I'd receive and reply to emails, Slack and Twitter. By early 2018, I'd suffered total burnout. I needed a break: seven days with my family, in the sun with a book, my phone fully disconnected. It was delightful while it lasted and I'll do it more often. As I turned off airplane mode after hitting the runway at Manchester, I got one text, multiple emails and three phone calls before I even got to my car.



LAUREN KELLY

**Design psychologist,**  
**BehaviourStudio**  
[behaviour.studio](http://behaviour.studio)

 When I think about it, I realise the hard truth. I don't go fully off grid and haven't done for years. As a business owner, it's hard to ever completely step away. I do however build micro-moments of respite into my day.

Those micro-moments are based around my phone. Psychologists have found that the presence of a phone is enough to limit your cognitive capacity, even on occasions when it is turned off.

So my phone is app-free, set to silent and mostly absent. That way it doesn't draw my attention. And even if it does, it means that I don't fall down an app hole.

I love my phone... just as long as it's at arm's length.

**SUE JENKINS**

Creative director, Luckychair  
[Luckychair.com](http://luckychair.com)

Normally I need to keep my phone handy because the nature of my work is to be responsive within a reasonable time frame. I also take a lot of photographs as reference material. Typically though, it's on vibrate mode and switched to do not disturb when I'm driving, sleeping, teaching, recording videos or at the cinema. I also keep it off during important meetings, appointments and classes at the gym. I value my quiet time and don't feel like I'm missing out when my phone or laptop are not nearby.

**PATRYK KABAJ**

Co-founder and digital product manager, Packhelp  
[packhelp.com](http://packhelp.com)

I rarely go fully off grid. It's not that I'm addicted to social media, it's just that I find technology such a great tool to learn new things, whether it's a few hours on my Kindle or picking up something new on my phone. I do balance it with downtime, however. As a dog owner, I often head out somewhere scenic for a two- or three-hour walk where I'll rarely reach for my phone. Similarly, I find sports a great way to escape the connected world, followed by longer holidays and trips to more remote parts of the globe.

**JOSHUA JENKINS**

Freelance designer  
[www.thehandunseen.com](http://www.thehandunseen.com)

Even in the 15th hour, back hurting, eyes burning and hungry I always suspect I'm five minutes away from that creative breakthrough. But design is problem-solving and you don't have to be sitting in front of the problem to be solving it. You can be exercising, out in nature readjusting your eyes or with your family being social.

I find going off grid only slightly more difficult than going to the gym every morning. I hate the gym but I acknowledge it's part of the process. Getting off the grid is no different. It's difficult but ultimately makes me better.

**ADRIAN TEAGUE**

Senior product designer, W12 Studios  
[www.w12studios.com](http://www.w12studios.com)

A while ago I thought I'd try to go off grid, away from distractions from my phone. But I failed. Without use of a mobile I'd plan things in advance, setting specific times and places when meeting friends, which does make you think more. But also it made me realise how easier it is with technology. So instead – and this is only because of a realisation of me failing so many times – I choose to pick the right battles, uninstalling the noise and self-reflecting often to keep the stuff I feel adds value, not distraction.

## RESOURCES

### MOMENT

[Inthemoment.io](http://inthemoment.io)

 Aimed at luring people away from their technological addictions, Moment is a free iOS app that automatically tracks how much you use your iPhone and iPad each day. If you feel you're using your devices too much, you can set daily limits and be notified when you go over.

### GEEK MENTAL HELP WEEK

[geekmentalhelp.com](http://geekmentalhelp.com)

 Taking place every October, Geek Mental Help Week is an industry initiative that generates articles, blog posts, conversations, podcasts and events across the web about mental health issues. Many of these resources can be found all year on its website.

### THE CENTER FOR INTERNET AND TECHNOLOGY ADDICTION

[virtual-addiction.com](http://virtual-addiction.com)

 The book *Virtual Addiction* by Dr Greenfield rang an early warning bell regarding the USA's internet addiction problem and the associated website is packed with resources related to the issue.



\* UX

# 5 COUNTERINTUITIVE CONVERSION TRICKS

**Sam Nazari** reveals pearls of wisdom unearthed by artificial intelligence that will help convert customers

**>** Conversions are often a clear driver of profit. It's no surprise then that keen developers religiously test their websites to find the design that drives the most conversions. While the process may seem simple enough, the key to higher conversions is not always intuitive.

Enter AI. Using the enormous power of artificial intelligence, it's possible to test every idea a marketer could imagine, shedding light on the mysterious world of what makes people convert. Here are five counterintuitive findings uncovered by AI-powered conversion testing.

## BE INDIRECT

Conversion experts always stress that specific, direct CTAs are paramount to driving conversions. However, using biometric tests, HR GO plc, a job

placement firm, found that visitors felt stressed on its website and that urgent messages discouraged them. AI revealed that directional text like 'Read more' increased conversions far more than previous variations. These changes resulted in a 153 per cent conversion rate increase (<https://netm.ag/2uNQUvJ>).

## EXPAND YOUR PALETTE

ABUV Media creates content-rich websites that help people make informed decisions about their future. It wanted to test hypotheses about its form that connects users to universities. Using AI, it found the best-performing form variant was a designer's worst nightmare: a hot pink form widget whose fields contained green text. Nevertheless, this design increased conversion rates by 45 per cent.

## REORDER YOUR FUNNEL

We're all used to a shopping funnel: add item to cart, input your address, then your payment option and finally hit the order button. But Nexway, which provides full-service ecommerce and marketplace solutions, found that this formula was dated. It saw a 17 per cent conversion rate increase by simply reversing the payment and address fields in the checkout process, among a few other small changes (<https://netm.ag/2NsEpNK>).

## FOCUS ON THE SEARCH BAR

Sometimes highlighting a feature like the search bar is just the extra push the customer needs in order to engage with it. One online tobacco company, for instance, outlined its search bar with a thick, dark border so it would be easier to find. This visual highlight increased the customer's interaction with the search bar, so that they found exactly what they were looking for faster than when browsing generic categories. As a result, this company saw a 4.4 per cent conversion lift towards its goal of increasing online sales.

## DEFY COLOUR CONVENTION

We were surprised to find that when we tested pink buttons against the original black buttons on online lingerie retailer Cosabella's website, the pink outperformed the black, betraying our intuition about Cosabella's shoppers (<https://netm.ag/2O3nvGI>). Lingerie is usually thought of as sexy, sleek and sophisticated so black seemed like the perfect colour – except it wasn't.

With traditional A/B tests, these companies might have tested more conservative hypotheses because their testing volume is limited. With AI, however, they were able to test all of their ideas at once, leveraging the power of evolutionary algorithms to reveal the best performing variants quickly. This all goes to show that testing more and not being afraid to try new ideas can lead to massive improvements. ■

Sam Nazari is the global head of solutions engineering at Sentient Technologies. He heads up the team that works with clients to help them integrate AI across their organisations.

PROFILE  
\*

# Digital Camera

## PHOTOGRAPHER OF THE YEAR 2019

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# Digital Camera

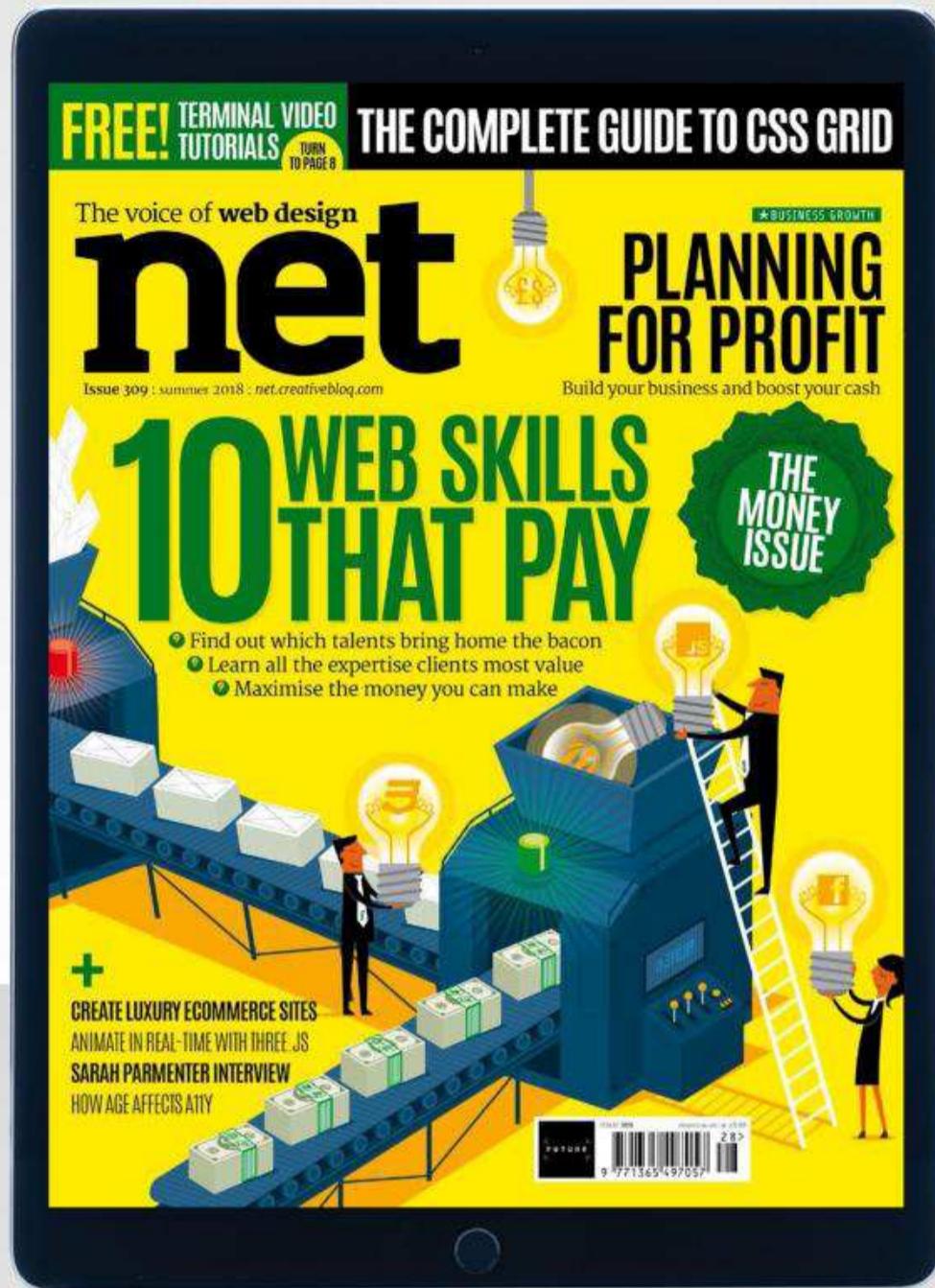
## YOUNG PHOTOGRAPHER OF THE YEAR 2019

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Explore the evolution of progressive web apps, stay nimble using agile design and become a machine-learning master



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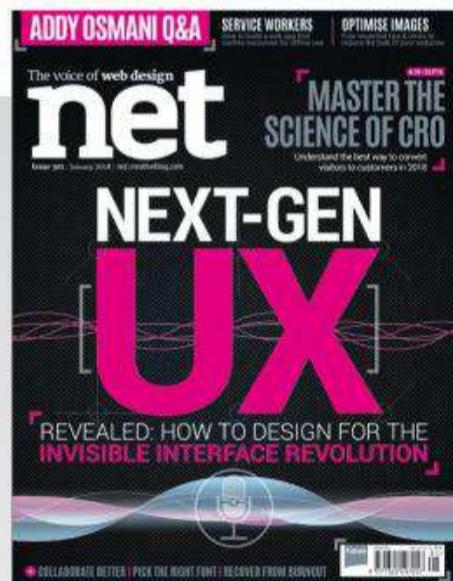
#304 APR 2018

Explore CSS animation with Animista.net's creators. Code custom WebGL effects, prototype with Origami and top PWA tips



#302 FEB 2018

50 amazing dev tools for 2018, plus prototyping at Netflix and a free, bumper 20-page design trends supplement



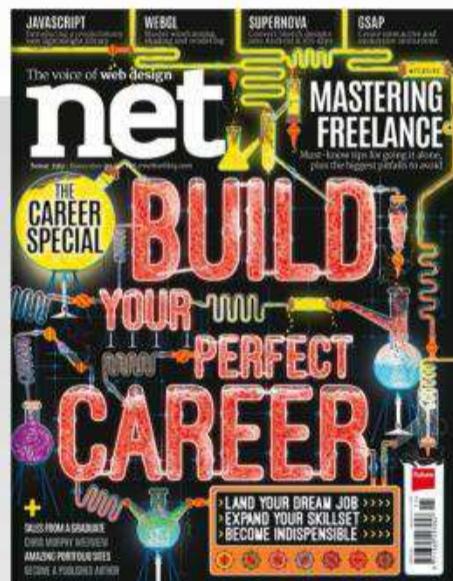
#301 JAN 2018

Next-gen UX. Revealed: how to design for the invisible interface revolution, plus master the science of Conversation Rate Optimisation



#300 DEC 2017

Web visionaries investigate what's next for design and the internet in our special 300th edition, plus 30 greatest web moments



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Sensational design and superb development

JONAS DOWNEY



Jonas Downey is a product designer at Basecamp, co-creator of Hello Weather, an avid writer and pun jokester.

**w:** <http://jonas.do>  
**t:** @jonasdowney

★ HOMEGROWN STATIC SITE, GULP, NETLIFY

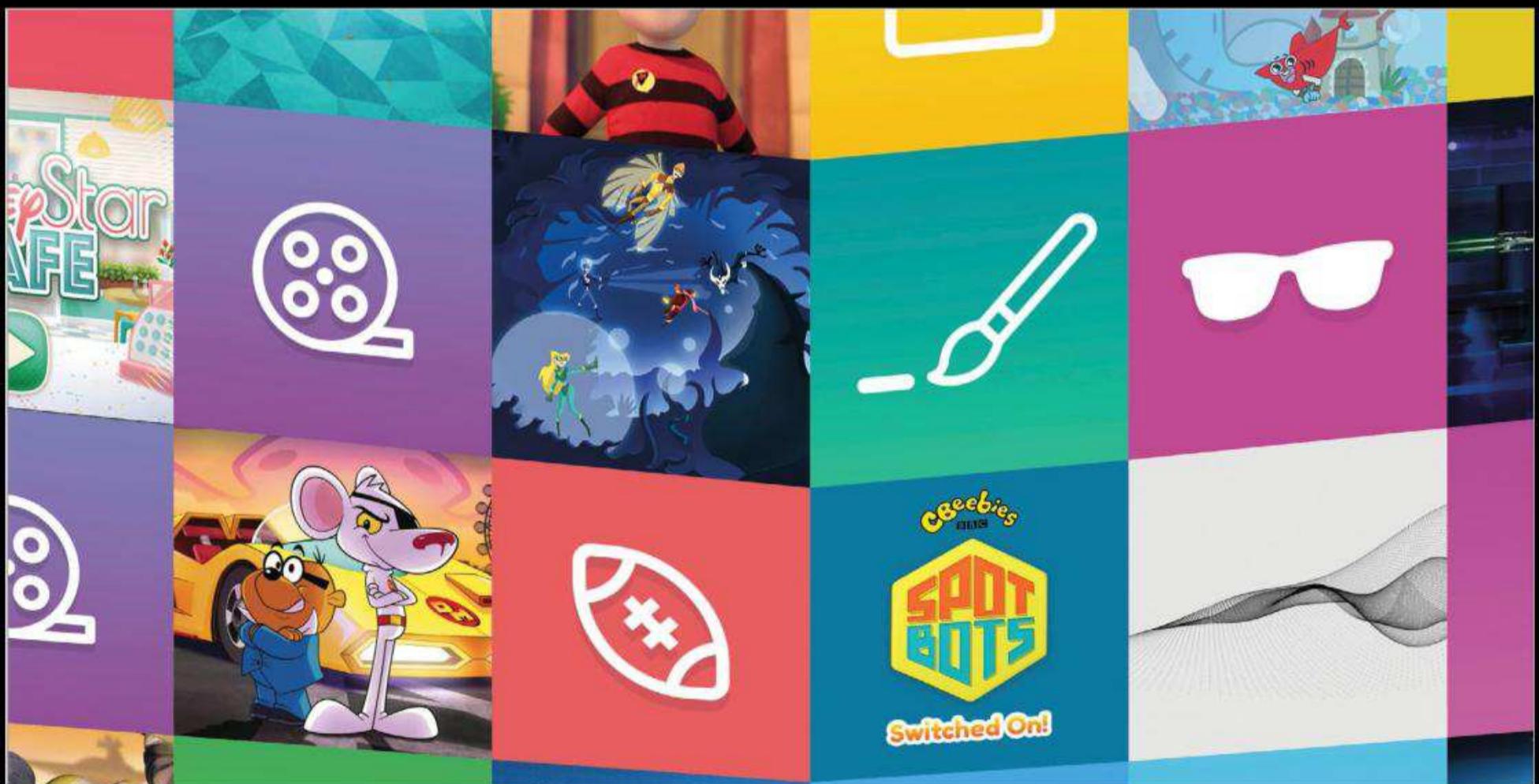
XOXO 2018

<https://2018.xoxofest.com>

I was fortunate to attend the first-ever XOXO festival in 2012; it had a big impact on how I think about the web and its creative community to this day. I'm thrilled to see that the event is still going strong – it's a weekend-long love letter to creativity, joy, failure and independence on the net. The experience is cathartic, energetic and wonderfully earnest.

This year's website matches that spirit, with a torchlight-sunrise colour palette atop a gorgeous full-length illustration by Shawna X, paired with tilted text in a nearly-hard-to-read handwritten script and monospaced fonts. It's simultaneously a bit techie and human.

The site's designer, Paulo Pereira, explains the creative process: "We wanted Shawna's work to dominate the site and be the driving force of the design. Once I could see where she was going with it, I looked at typefaces and colours that would vibe with the illustration's free-flowing shapes and vibrant palette. At the same time, I very much wanted to stay away from the dominant web design look – the refined, clean and polished aesthetic of tasteful sans-serifs and desaturated pastel colours. I'm pleased with how Shawna's fantastic artwork takes over the site and sets its tone and [how] the content tags along with some personality too."



\* WEBGL (SELF-MADE LIBRARY)

## MADCLEM

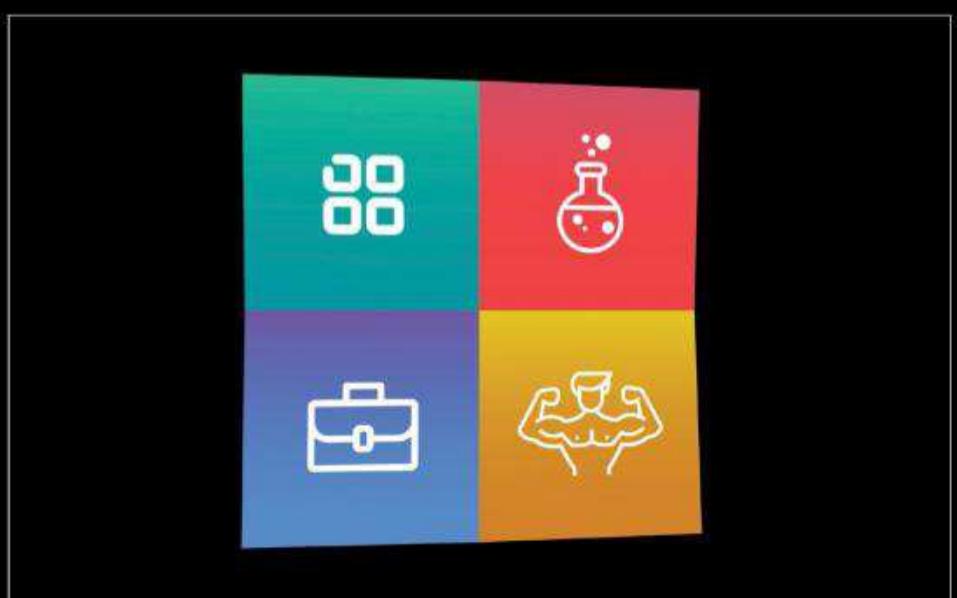
<https://madclem.github.io>

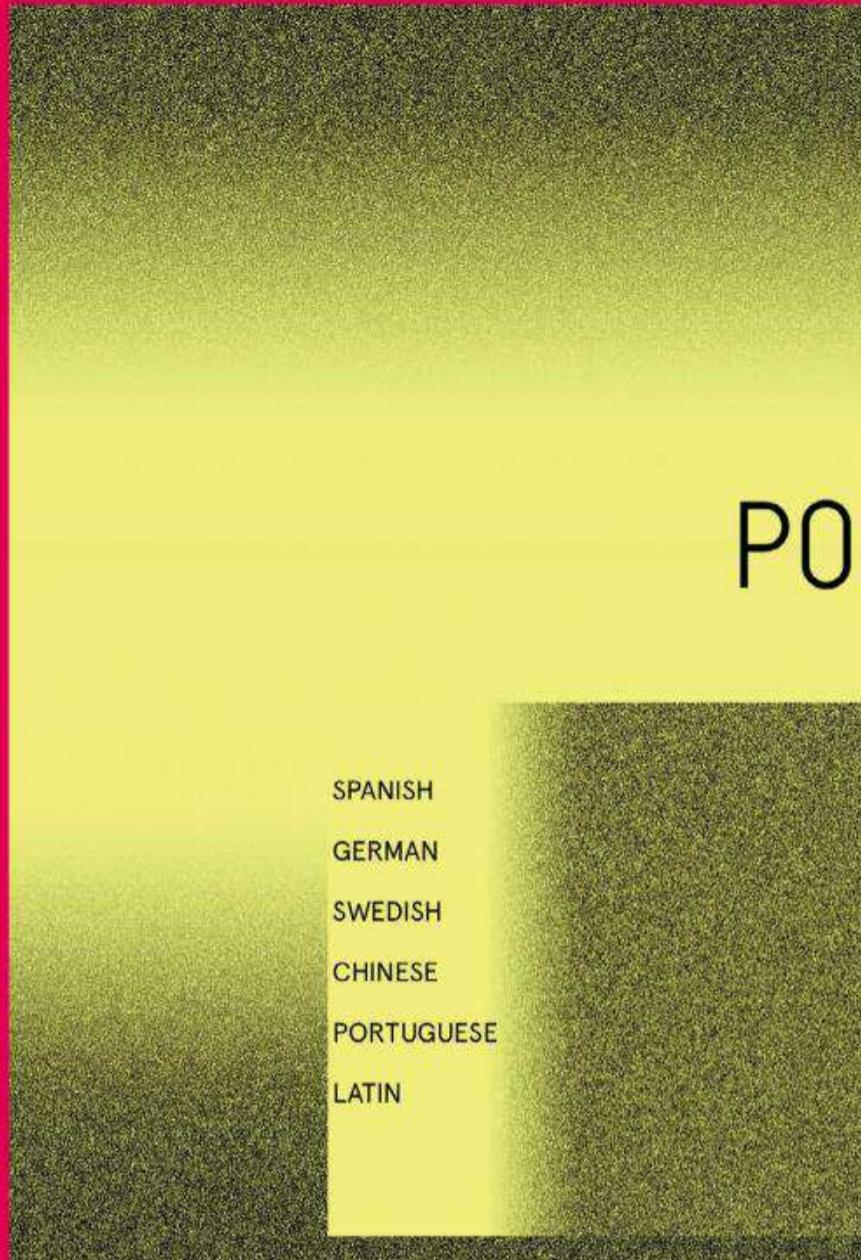
Since the web's inception, developers and designers have pushed and shoved at the outer edges of what's possible, seeking to do something new or interesting and pushing back on expectations for what a website is and how it works. This free-spirited experimentation is a hallmark of the weird, wild web and it's one of the things I love about working in this medium.

Clément Chenebault's portfolio site, MADCLEM, follows in that storied tradition of pushing boundaries, turning a simple grid of colourful squares into a fluid, malleable mass of liquid blobbery. The whole site bends and bulges with every movement you make, expanding and contracting to show little glimpses of portfolio pieces as you find your way through the gelatinous mass. The site is a fun, wavy island among an often monotonous sea of same-y looking designer and developer portfolios.

"I focused on a simple 'feel good' user experience. The key was to find a satisfying interaction: the bouncy animations seemed a perfect fit."

CLÉMENT CHENEBAULT





# Hi. My name is Nick and this is RANDOM LANGUAGE POETRY

Poetry rules are universal:

rhyme, rhythm, structure,

You can feel poetry, and it has nothing to do with meaning.

I pick a language which I absolutely don't know.  
Then I choose my favorite book in this language.  
I listen to hundreds of random words from the book.  
At this stage, the meaning is still a mystery to me. I put words  
together to create a poem based what they sound like.  
For every poem, I use a different poetry style,  
from Romanticism to Futurism.

Take a look at some of the poems and read the translation.  
Sometimes it's funny, sometimes it's philosophical.



\* READY MAG, CUSTOM CODE

## RANDOM LANGUAGE POETRY

<http://randomlanguagepoetry.com>

In the last decade or so, web designers have been piling on loads of tech and trendy JavaScript plugins to show off overwrought visual effects. On sites like that, the implementation overwhelms everything else. Reading, navigation and UX often feel like an afterthought.

That's why it's thrilling to see web tech used artfully, to support and magnify a concept rather than overwhelm it. And so it is with Random Language Poetry, a clever and funny project by copywriter Nick Arzhantsev and designer Artem Matyushkin.

Arzhantsev wrote poetry using a somewhat-algorithmic method: aurally selecting words from books written in foreign languages and then retranslating back to English. The site's design perfectly complements the idea; you're dropped in a lost-in-translation purgatory, stranded somewhere between cognisance and incoherence. Reading the reconstructed snippets is sort of like making sense out of a weakly tuned radio transmission.

Built on the Readymag platform with a bit of custom code, Arzhantsev describes the site as a means to intrigue people to explore. "We're trying to find a way to make people read the description and navigate the website with the unusual and brutalist design," he says.

LATIN

那一头那我  
那个宝不是  
看那邻国  
手枪来认识

PORTUGUESE

金属的脚镣危害  
用手去险生  
塞在我的小袋光  
为它危心中

CHINESE

不静了  
声吧  
它样  
想怕  
设若刚才随着么

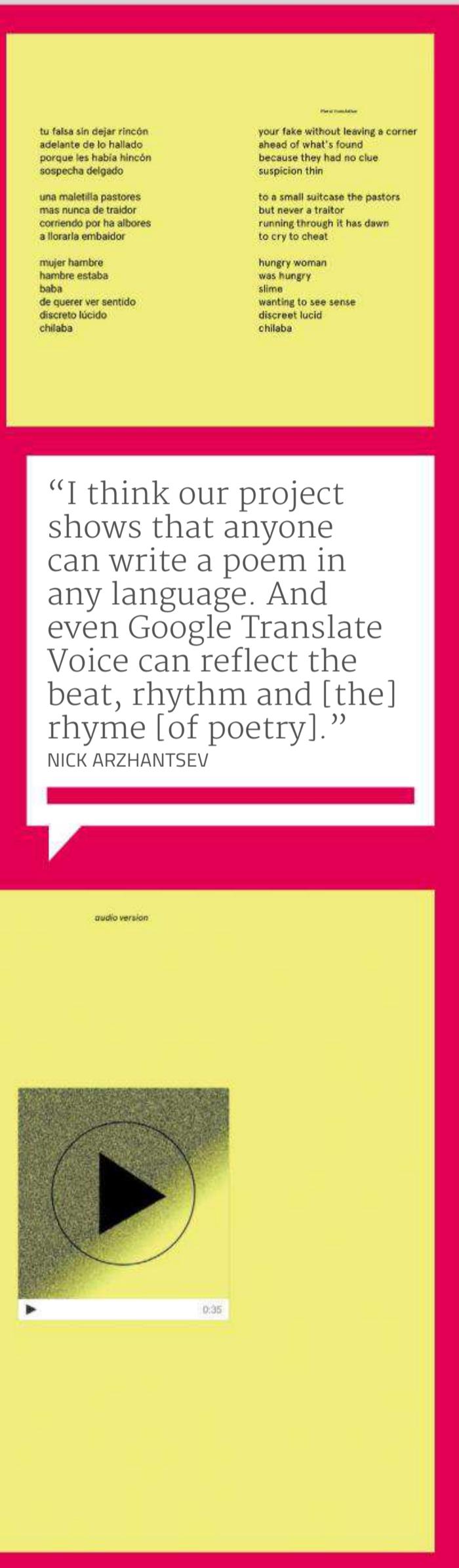
SWEDISH

被后面那静  
时的情七  
也未尝不明  
不愿意回西

GERMAN

住在哪里有  
五百年中又

SPANISH



"I think our project shows that anyone can write a poem in any language. And even Google Translate Voice can reflect the beat, rhythm and [the] rhyme [of poetry]."

NICK ARZHANTSEV

[audio version](#)

0:35

\* HTML, JIGSAW, TAILWIND CSS

## REFACTORING UI

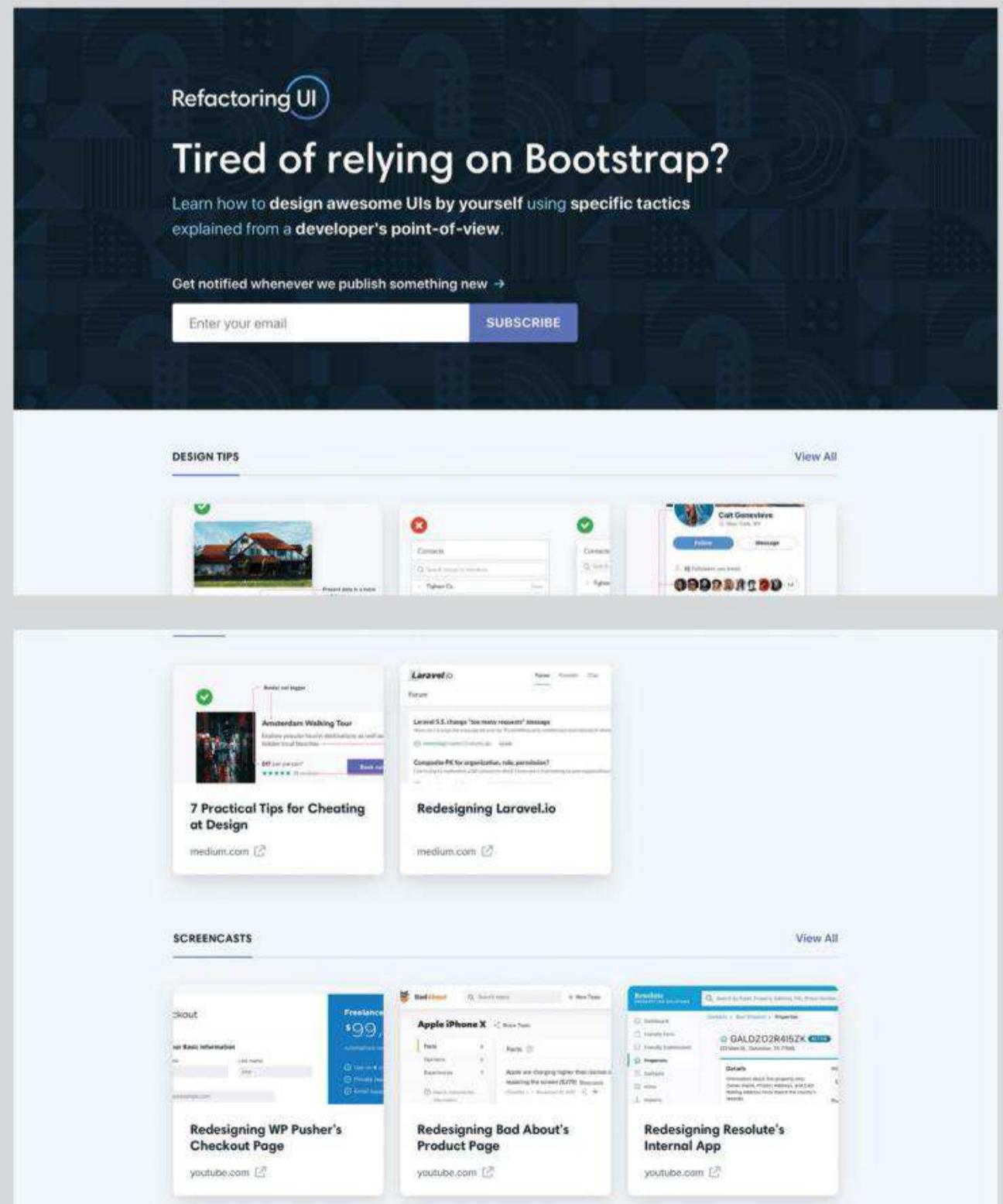
<https://refactoringui.com>

> Malcolm Gladwell famously stated that you need 10,000 hours of deliberate practice to become a world-class pro in a given discipline. Whether that figure is accurate or not, there's no question that years of experience will construct a vast array of large and small lessons deep in your psyche, which comprise what we think of as 'expertise'.

There's a tricky thing about expertise though. Once you've achieved it, it's easy to take for granted all the little bits of knowledge and sweat equity you've

accumulated. They become an automatic part of you and your work process.

Refactoring UI, a new project by Adam Wathan and Steve Schoger, aims to distil those little morsels of learned-the-hard-way brilliance into digestible bite-sized nuggets to help less experienced UI designers improve faster. The site itself is an aggregation of tweets, screencasts and blog posts sharing those secret little tricks of the trade. It's a novel approach that's just getting started and a lovely site I'll definitely be revisiting.



Refactoring UI

## Tired of relying on Bootstrap?

Learn how to design awesome UIs by yourself using specific tactics explained from a developer's point-of-view.

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# CHOCO BROWN

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Contains wheat, eggs, milk, soy beans, nuts, gelatin.

Using quality single origin columbian cocoa beans from Kamakura's chocolatier ca ca o, we are changing your mindset of the classic parfait by bringing you a new experience of different elements characterised by different ingredients.

Fluffy, soft yet not too sweet melt-in-your-mouth Chocolate mousse.



No, it's not a softcream, it's not whipped cream either. It's our signature meringue that gives that extra crunch and punch to your parfait!



Chocolate brownie chunks made from quality single-origin cocoa beans sourced by Chocolatier ca ca o of Kamakura.

\* GSAP, CSS TRANSFORMS, INLINE VIDEO

## THE PARFAIT STAND

<https://theperfaitstand.com/>

> The blazing heat of summer is in full force and this fantastic site for a small parfait shop near Tokyo cooled me off. It looks simple at first glance but on closer inspection it's a deceptively complex one-page design that uses subtle motion to turn a flat design into a unique and surprisingly dimensional affair.

Free floating buttons orbit the parfaits like little satellites affected in a gravitational lock. Track one of them down long enough to click it and you'll be greeted with masterfully-built, full-screen animations that transition to modal detail views.

Looped video is also used in a clever way, cropped into circles, showing the making of a luxurious chocolate dessert. Ultra-stylised photos of the restaurant and food complete the experience, with overlapping layers of visuals animated in staggered timing. It's a fun and inspiring treat. I'm off to grab a spoon now! ■



# PUT A PAUSE IN YOUR DAY

With so many demands from work, home and family, there never seem to be enough hours in the day for you. Why not press pause once in a while, curl up with your favourite magazine and put a little oasis of 'you' in your day.



**PRESS PAUSE**  
ENJOY A MAGAZINE MOMENT

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**pauseyourday.co.uk**

# SHOWCASE

Sublime design  
& creative advice

THIS MONTH FEATURING...



## PROFILE

50

Samuel Honigstein on cutting his teeth in Google's creative hothouse and why he's never happier than when he's out of his comfort zone



## HOW WE BUILT

56

The District explains how it gave veteran brand and packaging agency, Free The Birds, an elegant typographic makeover for its new site

# DESIGN CHALLENGE

This month...  
**LIVE MUSIC VENUE**

\* PROFILES



### CHRIS SILVERMAN

Silverman is an award-winning senior designer and illustrator at Vassar College, New York.

w: [www.csilverman.com](http://www.csilverman.com) t: @\_csilverman



### CHRISTOPHER DOWSON

Dowson runs Interpunct, an ethically-minded design studio.

w: [interpunct.studio](http://interpunct.studio) t: @interpunctuated



### WARREN CHALLENGER

Challenger is senior designer at JH, a leading ecommerce agency based in Nottingham, UK.

w: [warch.io](http://warch.io) t: @warchdesign

## BRIEF

This month we would like you to design a website for a fictional live music venue. It must be easy for visitors to access information such as gig listings, location and opening hours, and your design can be image- or typography-led.

\* CHRIS SILVERMAN

## STATION FIVE

A site that brings the history of the building into its design

**1** Station Five is a club and restaurant in a former firehouse. The red/yellow palette, elements of brickwork and typography (Pompadour for logo and Highway Gothic, used on all US municipal signage) suggest its roots.

Photography plays a major role here; the gallery is the primary means for drawing visitors into the site. I didn't want the imagery to be overwhelming though and image carousels can be awkward. In this design, the images are the navigation. Hovering over an image expands it and clicking on it loads the page for that event. An additional benefit is that the varying widths – main image, secondary images – present a clearer hierarchy and guide the eye across the layout.

The detail I'm most proud of is the light beige stripe under the gallery. I liked the white background because it felt clean but it also seemed a little sterile for a design inspired by a firehouse. The beige stripe emphasised the top brickwork without dominating the design.

## CLOSE UP

**(1)** The gallery is designed to be easily browsable; hovering over a collapsed item expands it, while the other items narrow to accommodate. On phone screens or touch-based devices, all images would be fully displayed and Upcoming would be on its own row. (Event banners use typography specific to the event, not default site typography.) **(2)** The address and phone number are easily accessible in the top right. Given that many people will visit the site on their phones and may need to know quickly where the place is, this information would remain at the top when viewed on small screens, so users wouldn't need to scroll all the way to the footer. **(3)** Other venue information is clearly placed. While Directions is mostly cropped by the fold, this panel would have a background image of a map, with directions and a link to a Google map. **(4)** Station Five is a place with a past; this feature links to a page outlining the building's history and more notable acts. **(5)** News ranges from artist interviews to updates about the venue.

## MY MONTH

What have you been working on/doing this month?

Getting comfortable with web animation, building a style guide for Vassar, working on graphics for a friend's computer game and designing my first typeface!

Which two sites have you visited for inspiration?  
Hoefler's *discover.typography.com* and Teenage Engineering (<https://teenageengineering>).

What have you been watching?  
*The Jinx, Midsomer Murders.*

What have you been listening to?  
Marketplace and The Moth.



## MY MONTH

What have you been working on/doing this month?

Mostly changing nappies and having cuddles as we've welcomed Constance to the family. I'd finished a contract for Royal Mail before she arrived.

What have you been watching?

Mostly *Hey Duggee*, *Something Special* or *Go Jetters!* Sometimes I can sneak in a bit of *GLOW*.

What have you been listening to?

Chvrches, Passenger and Josh Garrels.

What sites did you visit for inspiration?

I didn't really visit any sites for inspiration – it's too easy to 'borrow' too many elements.

\* CHRISTOPHER DOWSON

## LEONARD BERNSTEIN HALL

A site that uses images with plenty of copy space and a simple booking procedure

**>** Leonard Bernstein Hall is a contemporary classical music venue that aims to widen the appeal of classical music.

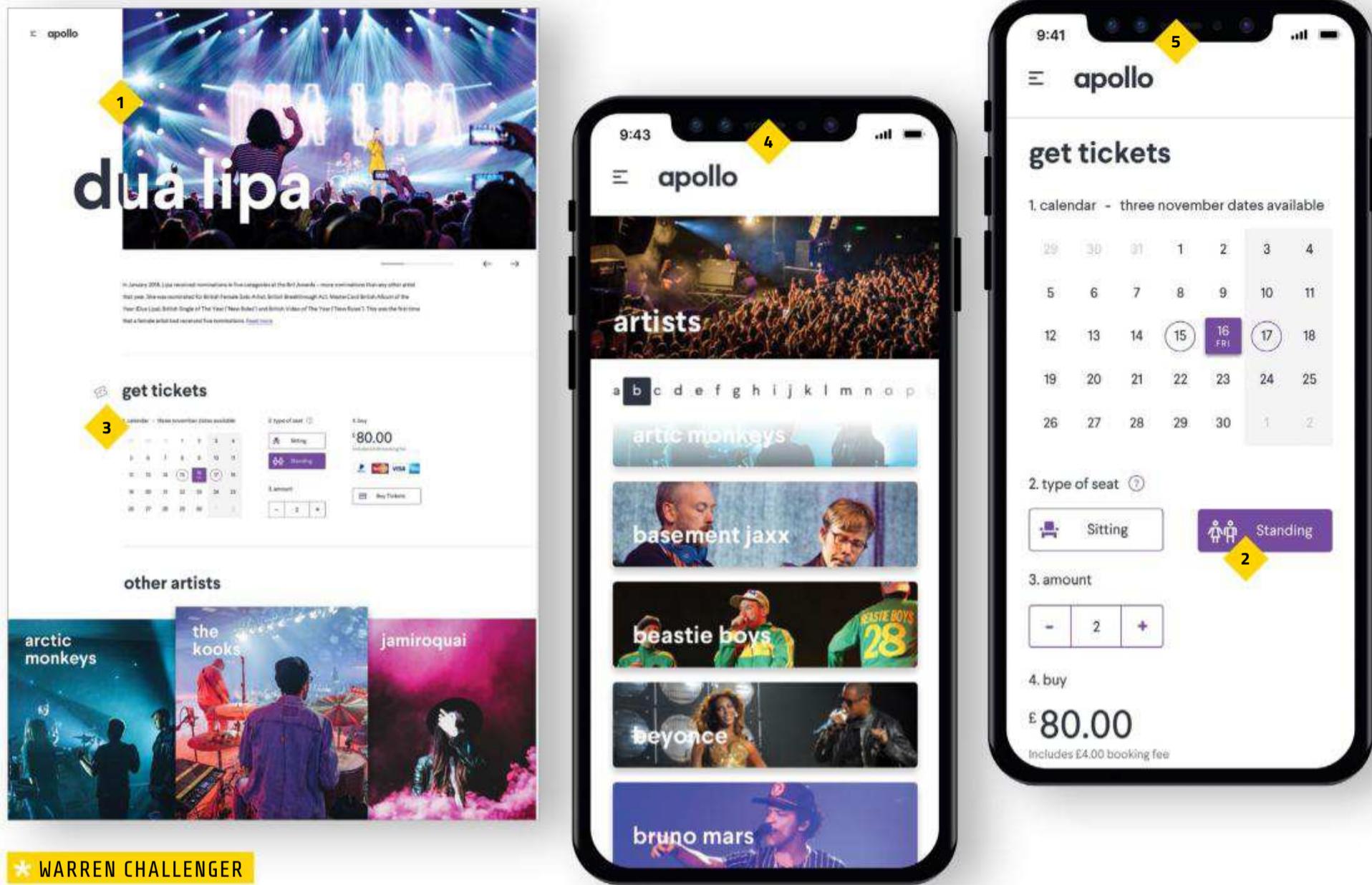
I chose an incredibly straightforward design for the site as I have found – during my research and also as a consumer – music venue websites like to throw everything at you. The minimal, dark palette takes its cues from the photography (thank you Kael Bloom via [unsplash.com](https://unsplash.com)) and a bolder, more editorial style for layout creates a site that chooses to educate the audience in a friendly, informal way.

You can come to the site and book straight away if you know the piece well or find out more – and even sample some of the music – to see if it's something you might like.

The site's mobile experience would be more focused on the post-booking experience, showing you your tickets and – crucially – directions to the venue.

## CLOSE UP

**(1)** The logo doesn't dominate the page as the site is for a destination location – you know where you are. Sometimes less really is more. **(2)** Images with a lot of copy space help with the editorial style of the layout. Setting the precedent for minimal text means the hero space could easily be split into three parts – for a season or event – and not feel cluttered. **(3)** The quick booking feature enables you to engage the second the site has loaded and see what's available to suit your schedule. Simply choose seats and specify any access requirements at the next step. **(4)** If you don't need to read up on the piece, you can simply book tickets. There should be no friction points at this stage (or any, in an ideal world), just simple, clear decisions. **(5)** Being able to hear a piece before you decide to book could be the difference between a conversion and a bounce. Some sites will let you read the first chapter of a book; it should be no different for music.



\* WARREN CHALLENGER

## THE APOLLO

A progressive web app that functions well even when it's offline

**>** The Apollo offers up music for every taste with both global and local acts. It is named after the Greek god Apollo; the god of music, truth and prophecy. The Apollo is open to all types of music artists and lets visitors get close to the musicians; there's nowhere to hide, no matter the name on stage.

The layout is minimal, clean with no hidden links or sneaky booking fee text. I achieved this by using sharp edges in the design. Keeping the layout mono makes the artist's photography shine and bring life to the mono palette.

The Apollo uses state-of-the-art technology to ensure the venue has maximum accessibility and the website is no different. The text is legible, calls to action are apparent and there's no reliance on JavaScript for content. It was built as a PWA with fast-loading push notifications about artists and gigs and the user can see the calendar of events from when they were last on the site.

## CLOSE UP

(1) The artist detail page shows the artist in a big hero carousel and title for ultimate clarity. (2) The colour palette is primarily mono but for the call-to-actions the website uses a JavaScript library similar to Colorify.js. This looks at the hero image of the page and extracts the colour to use on the calls-to-action and links (purple in this instance). All colours apart from yellow are available but if the JavaScript doesn't fire, the website uses the default pastel red. (3) The booking steps reveal as the user books a ticket, giving easy visual instructions of what is next. (4) As well as filtering the gigs by the date, the user can filter via the artist list. As the user scrolls down the list, the alphabet UI remains in view in a fixed posit. The user can touch a letter and anchor tags will take the user to their desired content smoothly using JavaScript when available. (5) The booking UI is nice and clean, allowing the fields to stack nicely on smaller devices.

## MY MONTH

What have you been working on/doing this month?

A website redesign for a shoe brand and improving the checkout process for a wellness company.

Which two websites have you visited for inspiration?

I looked through lots of sites for inspiration but particularly liked the Apple Music and Spotify apps.

What have you been watching?

Currently playing catch up and binge-watching *Westworld* season two.

What have you been listening to?

Michael Palin travel audiobooks and Childish Gambino.



★ PROFILE

# SAMUEL HONIGSTEIN

<http://samsy.ninja>

We speak to a developer who cut his teeth in Google's own creative hothouse and who's never happier than when he's way out of his comfort zone

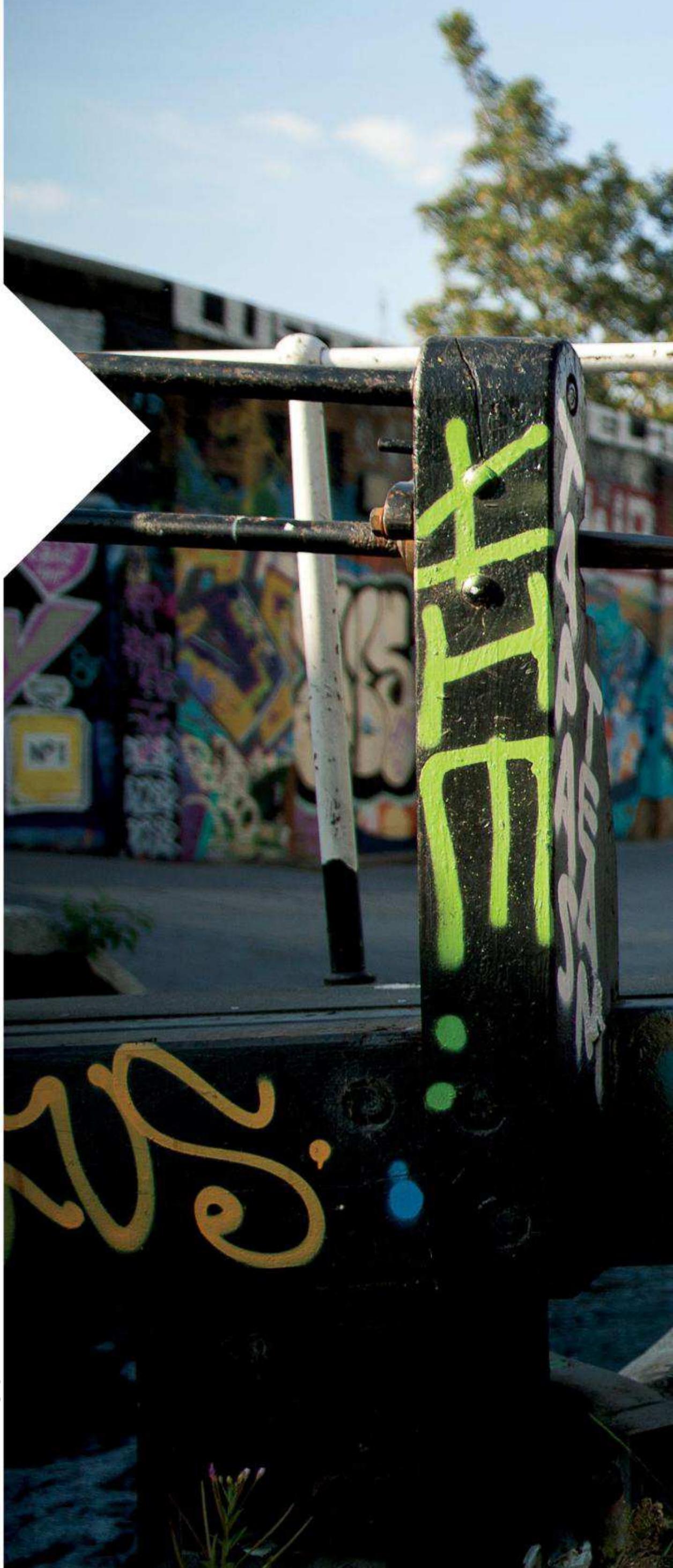
➤ Creative technologist Samuel Honigstein – AKA Samsy – specialises in creating amazing and immersive experiences both in the browser and beyond. Born and raised in the banlieues of Paris, he moved to London in 2015 as one of just five talents selected each year for Google Creative Lab's Five programme and he's been living and working in the UK ever since. Working with studios such as HUSH, Stink Studios and Nexus Interactive, he's been busy pushing the limits of what's possible in the browser, with a particular focus on VR and AR as well as a lot of WebGL. He's also picked up a fair share of awards in a very short space of time. We had to know more, so we got in touch...

Hi Samuel! Can you tell us a bit about yourself and your background?

I grew up in a small town in the suburb of Paris (Department 93 – Seine-Saint-Denis – for my people) and I was lucky enough to live in an artistic environment. A lot of my friends were already into things like music, graphic design and filmmaking – I guess that helps give you strength to undertake and believe in an artistic career.

I was supposed to become a graphic designer but ended up making things

► Photographer: Anaïs Zamboni (@anaiszzamboni)





## INFO

**Location:** London, United Kingdom

**Designing since:** 2013

**Expertise:** Creative technology, WebGL, installations, real-time rendering, WebXR

**Studios:** Stink Studios, B-Reel, Nexus Interactive, HUSH

**Clients:** Google, Chanel, Warner Bros, Ninja Tune

**Awards:** FWA, Awwwards, Cannes Lion, Chrome experiments

- with code – however that wasn't straightforward. Through literature, academic art, graphic design and photography, I found my way into something that drives me every day: conceiving, designing and producing digital experiences.

**You spent a year working at Google Creative Lab in London. What did you learn there?**

Fresh after graduation, I was part of a programme at Google Creative Lab called Five ([www.creativelab5.com](http://www.creativelab5.com)). Every year the Creative Lab offers a few junior roles.

I realised there how a small, extremely talented team could push for an impact that outweighs our footprint. Projects that can potentially target hundreds of millions of people are quite challenging – it brings a huge scale to any project – so learning that aspect was fascinating. Overall, working with designers, writers, filmmakers, animators, producers and creative technologists was a very inspiring experience and it led me to my actual career.

**How would you describe your job?**

I help people to understand the technical and graphical challenges that might one day influence the very fabric of the digital craft, as well as making things to help creatives answer their questions using 3D interactive graphics, VR / AR, computational code and visual arts.

There's a different challenge every day; it depends a lot on the nature of the actual project. But it often involves a lot of R&D phases, some design iterations, a bit of maths and a few coffees.

**You have a separate site for your experiments. Can you tell us about them?**

Absolutely, there is [samsy.ninja](http://samsy.ninja) and the negative of it: [lab.samsy.ninja](http://lab.samsy.ninja). This experiment website is kind of a technological playground where I showcase a few of my personal studies in multiple rendering areas (covering things such as volumetric light, noise and fluid simulation).

I've always thought personal work and studies sometimes say more than actual professional work. It led me to where I



For Arkade London, Honigstein got to work with his favourite designer on this VJ project that enables users to play with FX and drag-and-drop MP3s

am today, so it's an important part of my professional portfolio.

There is a whole area in computer graphics programming that I love to call 'mastering the noise'. Noise functions have always been enigmatic, magical and powerful. They can help create generative landscapes, drive a flocking system, build fancy mask transitions and plenty of other things. Such things allow you to create the effect on my lab homepage using a curl noise all calculated in the GPU or the 3D dot-matrix Tron effect ([samsy.ninja/pointpoints/index.html](http://samsy.ninja/pointpoints/index.html)).

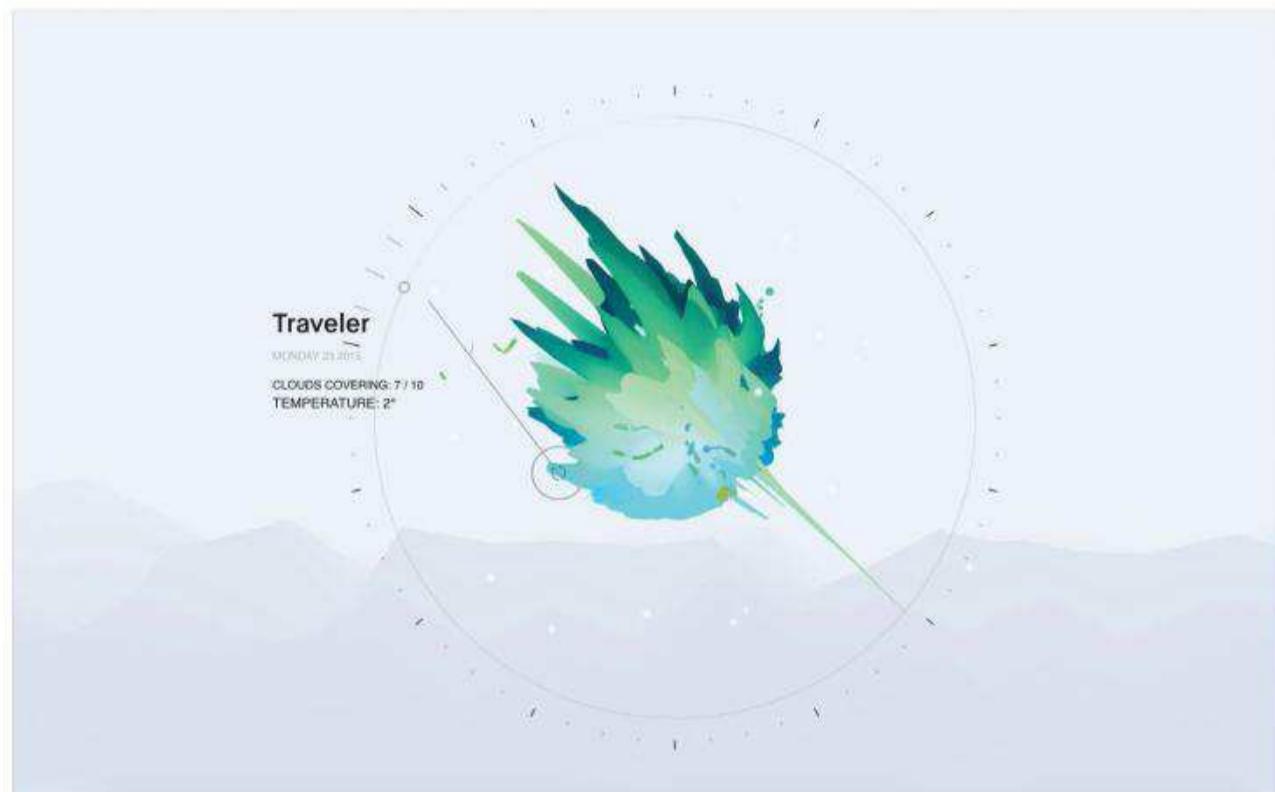
Of all the personal technical experiments I've been working on, the liquid simulation ([samsy.ninja/milkynoshare/index.html](http://samsy.ninja/milkynoshare/index.html)) is probably the one I learnt the most from and I've been asked by a few clients in the past to work on similar effects. Originally I wasn't much into mathematics and physics but I did get used to it. After reading the NVIDIA GPU gems about the Jacobi fluid solver ([https://developer.nvidia.com/sites/all/modules/custom/gpugems/books/GPUGems/gpugems\\_ch38.html](https://developer.nvidia.com/sites/all/modules/custom/gpugems/books/GPUGems/gpugems_ch38.html)), I found myself translating an actual maths paper into working code. It took me a week but it was worth it! You can use such simulations as noise to drive a particle

simulation or, as was the case in this example, drive a surface!

**You worked on a dataviz project for HUSH / Capital One in which workplace brand visualisations were projected onto a giant wall display. Can you tell us a bit about what that involved?**

A great deal of R&D! Expressing something meaningful for the people who experience it is the most important thing in a dataviz project. At HUSH ([heyhush.com](http://heyhush.com)), I was part of a team that designed a complete and ever-changing generative system that constantly evolved 24/7/365, running in WebGL ([heyhush.com/work/capital-one-workplace-brand-visualizations](http://heyhush.com/work/capital-one-workplace-brand-visualizations)).

We leveraged internal and external data insights to convey unique trends from various aspects of the company. A lot of live iterations, discussions and real-time coding phases were implemented on that project. From a technical point of view, we had to keep things extremely performant, reducing WebGL draw-calls and optimising shaders. We even had to rebuild Chromium from sources and relax the maximum buffer-size limitation of Chromium to help us render in real-time at full resolution up to 16K.



This dataviz experiment was created as part of Honigstein's graduation project when he was at GOBELINS art school

### You built an audio-reactive art project for Arkade London. What was its purpose?

Arkade London ([arkade.london](http://arkade.london)) is an online experimental VJ fan-art project made with my favourite designer Steven Mengin ([www.stevenmengin.com](http://www.stevenmengin.com)). It gives users some graphic superpowers, featuring my favourite music artists in the world. You can play with your keyboard to trigger FX and drag-and-drop any MP3s to play with your favourite playlist!

It is made to give people a [way] to play with graphics at events and parties. It's been designed so it can be projected on big walls and give easy access to DJs who need graphic visuals for their shows. It started as a web experiment but we ended up spending our nights working on pumping trippy visuals!

### Tell us about your VR project for HERE Vision ([here.com/visionVR](http://here.com/visionVR))

The story this experience is telling is 'discover how the autonomous world will revolutionise city planning, business and personal travel'. I was asked to help B-Reel ([www.b-reel.com](http://www.b-reel.com)) in London to create a WebVR mobile-first experience that lets you travel to futuristic places and experience what smart cities could look like.

Text and UI elements are generated and rendered in straight WebGL, while each visual component used is time-coded according to the 360 video. These are editable using a homemade CMS and a live edition debug tool including text, UI, icons, voiceover, spatial sound and video fades and cuts. That made the content integration really easy once the system was in place. On the homepage, flocking lines are driven with a few modified Lorenz strange attractor simulations, from a nice point of view at the centre of it.

### WebGL, VR and AR feature heavily in your work. What's your opinion on the state of VR and AR right now?

I have a lot of interest in real-time 3D graphics rendering, studying pipelines and how things are made. This field has grown significantly and experiences are richer; more tools and content are created every day in a lot of areas. People can access experiences seamlessly by visiting a URL with their mobile phone without even downloading an app.

I guess we are still discovering some new interactive ways of telling a story and VR and AR are definitely part of the trip. However, I believe AR is evolving faster than VR because it is overlaying



**SAMUEL HONIGSTEIN**

**What's on your desktop?**  
A framed Japanese Raichu secret trading card.

**Little things that make your life worthwhile**

Websites: Hacker news, Shadertoy, The Book of Shaders  
Apps: Twitter, Uber, GMaps  
Audio: Low End Theory, ED Banger, Ninja Tune  
Reading: The New Scientist, Wired, MIT Technology review

**What do you have on the walls?**  
A Noogler cap and a traditional Japanese tenugui!

**What will you do for lunch?**  
Grab takeaway food and watch a series.

**What hours do you work?**  
Usually 10am to 7pm.

**What else do you do in the office?**  
Sleeping: my office is in my room, heh.

**How often do you hang out with other designers?**  
I'm living in a designer / developer flatshare, so every day.

**Describe your working culture in three words**  
Never. Underestimate. Yourself.

**★ TIMELINE**

Key dates for  
Samuel Honigstein

**JUNE, 2009**

Obtained French literature and  
philosophy high school diploma.

**JUNE, 2010**

Started academic drawing, painting.

**JUNE, 2011**

Attended graphic design uni courses.

**MAY, 2012**

Joined a light-painting photography  
collective.

**JUNE, 2013**

Completed first project involving coding  
(real-time light painting software).

**SEPTEMBER, 2013**

Secured first job: a creative coding  
apprenticeship.

**JUNE, 2015**

Graduated from GOBELINS art school in  
Paris, digital section.

**SEPTEMBER, 2015**

Moved to London from Paris to join  
Google Creative Lab Five programme.

**OCTOBER, 2016**

Started as a freelancer.

**JANUARY, 2017**

Completed first international project.



Honigstein worked with B-Reel to create an immersive WebVR project for HERE Vision visualising the Autonomous World

► reality, it lets us interact with our environment and does not require any headset. Today, AR probably has more real use-cases than VR. ARKit and ARCore let us access positional tracking directly on our mobile phone. And the WebXR API that lets you access AR data directly in a browser is coming soon.

**What are you working on at the moment?**

I started a spatial-mapping project that helps reconstruct and mesh 3D spaces just using a web browser. Who would have thought those kind of things are possible today by just reaching an URL?

**What projects do you find rewarding?**

Those you think you don't have the skills to manage at first glance. You accept these projects because they are technically motivating and, as a creative technologist, you learn on a daily basis. You are often asked to dive into things you've never done before. The more you learn, the more rewarding the project is.

**What technologies do you find most exciting at the moment?**

Emscripten technology that ports C++ libraries into the web is amazing. I had the chance to spend time on it for personal project WebAR purposes. It opens a whole new door for web

development. I've recently seen a Nintendo 64 emulator actually running in an actual browser: [jquesnelle.github.io/mupen64plus-ui-console](https://jquesnelle.github.io/mupen64plus-ui-console). How could anyone have imagined this might happen on the web today and where's that going to lead us?

This technology might actually be a solution to multiplying the capacity, capabilities and speed of web browsers.

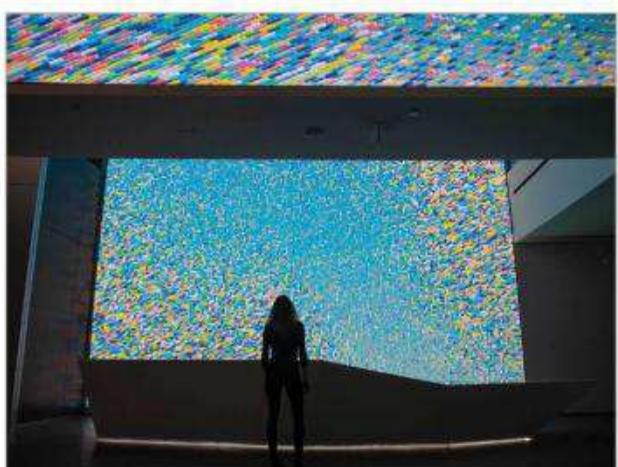
**How do you unwind when you're away from the keyboard?**

I live in a shared house: we get to have a lot of friends staying at our place during the year and we always have company at home, so we enjoy the garden and barbecues with flatmates and friends!

Also as a freelancer you get to travel a bit when you have no incoming contracts, otherwise I work remotely in some nice places. From time to time I go back in Paris to see family and friends. Otherwise I play a few video games, go swimming, walk often and hang out with friends in the city.

**Where do you see your career going?**

It's difficult to project myself a few years ahead but I'm thinking of working on something bigger. I've got a few ideas and have always wanted to open and lead a digital production studio. **n**



This visualisation project by HUSH for Capital One meant a lot of heavyweight technical work

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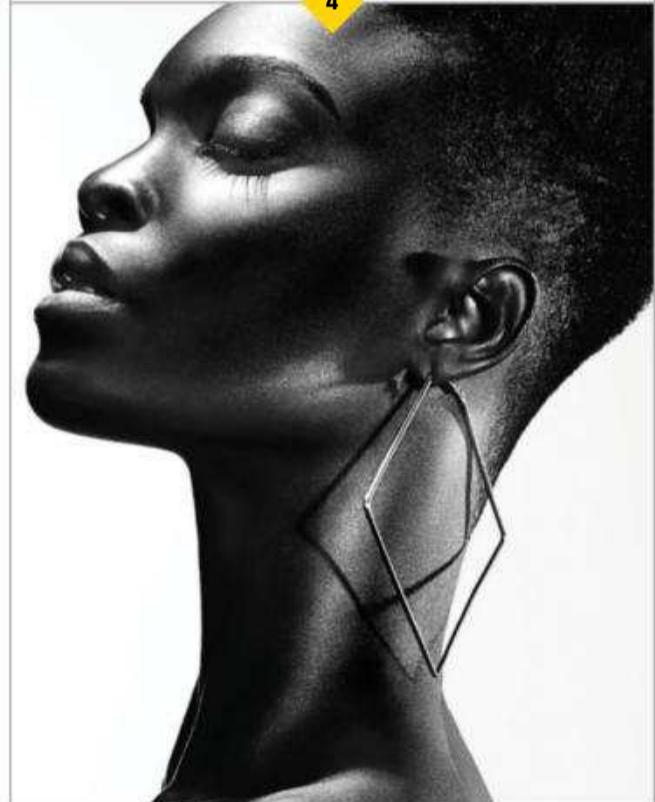
**SIGN UP  
NOW!**



★ HOW WE BUILT

# FREE THE BIRDS

The team from The District explain how they gave a veteran brand and packaging agency an elegant typographic makeover for its new site

<p>Think beautiful. We're here because we want to create beautiful <i>work</i> not just in appearance but in <i>thought</i>. As effective as it is attractive. Not just every picture but every design and image should tell a <i>story</i>. What we do surrounds <i>people</i>, everyone, every day. You can <i>call us</i> dreamers but doesn't everyone want to <i>believe</i> in a more beautiful place?</p>	<p><b>1</b> <i>work</i> <i>people</i></p> <p><b>2</b> <i>thought</i> <i>story</i> <i>call us</i> <i>believe</i></p>	<p><b>3</b> <i>work</i></p>
	<p><b>4</b></p> <p>We don't just need to know what's going on, we have to <i>feel</i> what's going on. In our key areas of Health, Beauty, Household and wider Social issues, So, we collect and curate the most interesting, most innovative Beautiful Thinking happening around us and around the world and season it with what we think about it all.</p> <p><b>5</b></p> <p><small>Beauty Unconscious</small> Time for a Double Gleamer</p> <p><small>Beauty Unconscious</small> Branding in the Digital Age</p>	<p><b>6</b></p> <p><i>Don't act ugly</i> We believe in respecting each other whether it is in business or in the wider world. Not just because it's nice but because it makes sense. Who wants to work with unpleasant people?</p> <p><b>7</b></p> <p>We look for the <i>story</i> in every brand we work with. This is ours.</p> <p>For 20 years, as Dew Gibbons and Partner created design and packaging for clients all over the world which embodies the philosophy Beautiful Thinking.</p> <p>As this philosophy is central to the way we work, we thought it should also become central to our identity. Leonardo Da Vinci is the essence of Beautiful Thinking. An artist. A designer. An inventor. An icon. It was his habit, when he</p>

## BRIEF

When branding and packaging agency DewGibbons + Partners rebranded this year as Free The Birds, it needed a site to reflect its new image. Enter The District and a strong typography-led approach.

## CLOSE UP

**(1)** The Free The Birds site uses typography to guide visitors around the content; the italicised words on the homepage act as the site's navigation. **(2)** When a visitor hovers over an italicised word on the homepage, all of the non-italicised words fade out. **(3)** If a visitor then stays on the italicised word for a further two seconds, it causes the other words to disappear. **(4)** The Work page houses a full-frame video to act as a showcase for Free The Birds' work and

clients. **(5)** The Thought page acts as a blog; it's home to articles written by Free The Birds' team and covers a range of topics across the design industry. **(6)** The Believe page is a click-through of three statements that summarise what Free The Birds stands for: Understand first, treasure ideas and don't act ugly. **(7)** A close-up shot of the Story page. It gives a brief retelling of Free The Birds' 20-year history and how it came up with its new identity.

## MATT BAGNALL



Creative partner at The District. He directed the design and build of the Free The Birds website.  
w: [www.linkedin.com/in/matt-bagnall-70a07236/](https://www.linkedin.com/in/matt-bagnall-70a07236/)

## ELLIOTT MOODY



Designer at The District. It was his responsibility to design the Free The Birds website.  
w: <https://the-brandidentity.com>  
t: @Moodo

## CHRIS BUTTERWORTH



Head of digital at The District. He built the Free The Birds website.  
w: <https://uk.linkedin.com/in/chrsbutterworth>  
t: @chris\_\_butters

**> Branding and packaging agency**  
DewGibbons + Partners has been working with global luxury, health and beauty brands for the past two decades. And as it approached its 21-year milestone, it decided to apply its philosophy of 'beautiful thinking' – putting respect for people and ideas at its heart – to rebranding itself as Free The Birds ([freethebirds.com](http://freethebirds.com)). The company brought in The District ([thedistrict.co.uk](http://thedistrict.co.uk)) to lend its expertise and develop a site that reflected its new identity. We spoke to the team to find out more.

### How did The District get involved with Free The Birds?

**MB:** Our work for other clients in the creative sector brought us to Free The Birds' attention and we were invited to pitch for the project. What we felt won the day for us was our brand-led approach to the project. As a design practice that works in a range of mediums, we approach every project by developing an understanding of the client's brand – by which we mean not just their logo but every touch point for their audience such as typography, use of negative space, tone of voice – and helping them to make decisions about the messages that they are strategically communicating. This gave us the edge over the primarily digital agencies we were up against and, ultimately, enabled us to create a concept that embraced their rebrand while remaining sympathetic to their history. The result was the perfect platform.

### What's the thinking behind the site's typography-led approach?

**MB:** After a couple of sessions with the client, one of our clear takeaways was their passion and belief in the power of their brand philosophy and that the first job of the new site should be to articulate this clearly. Often with clients blessed with great work images, the temptation is to show rather than tell, so going with a typography-led design might feel counter-intuitive. But words are as much at the core of what they do as design and embracing the primacy of type gives them a canvas to speak to their audiences, old and new.

### How did you arrive at your final choice of fonts?

**EM:** We wanted to give the site an elegant simplicity to match the ethos of the agency's beautiful thinking philosophy. Working alongside the development of its new identity meant that we got to test how fonts worked with our designs rather than being straitjacketed by existing brand guidelines.

We introduced Baskerville, which pairs with and complements the logotype font Gill Sans really well, and this pairing of a serif and a sans serif creates hierarchical messaging. It was fundamental that they worked online so a fair amount of tweaking/kerning was involved to ensure they looked great together on all devices.

### Could you talk us through some of the site's other design features?

**MB:** An important early concept was the large welcome copy on the home



### \*TIMELINE

Key dates in the Free The Birds project

#### NOVEMBER 2017

Free The Birds proposal presented and project awarded to The District.

#### DECEMBER 2017

Workshops, competitor analysis and fact finding.

#### EARLY JANUARY 2018

Wireframing, UX and content consultancy.

#### JANUARY – FEBRUARY 2018

Concepts created, experimenting with different mixes of serif and sans serif typefaces.

#### FEBRUARY 2018

Chosen concept and HTML scaffold developed.

#### LATE FEBRUARY 2018

Responsive and device testing to ensure consistent experience across all viewports.

#### MARCH 2018

Integration of content management system into the site.

#### APRIL 2018

Site launched.

Free The Birds  
Studio 2C  
Morelands  
5-23 Old Street  
London  
EC1V 9HL

+44 (0)20 7689 8999

New business  
Careers  
Press enquiries

[LinkedIn](#) [Twitter](#) [Facebook](#)

**Above** The Call Us page is home to all of Free The Birds' contact details



**1**

OPINIONS

WORK

PEOPLE

CONTACT

**2**

LONDON  
6TH FLOOR STUDIO 45  
GEE STREET  
EC1V 3RS

CONTACT  
+44 (0) 20 7689 8999  
[Info@freethebirds.com](mailto:Info@freethebirds.com)

**3**

FREE THE BIRDS

**4**

(1)

(2)

(3)

(4)

CON

FREE THE BIRDS

We're here because we want to create beautiful work<sup>(1)</sup>. As effective as it is attractive. Not just every picture but every design and image should tell a story<sup>(2)</sup>. What we do surrounds people<sup>(3)</sup>, everyone, every day. Call us<sup>(4)</sup> dreamers but doesn't everyone want to live in a more beautiful place?

We're here because we want to create beautiful work<sup>(1)</sup>. As effective as it is attractive. Not just every picture but every design and image should tell a story<sup>(2)</sup>. What we do surrounds people, everyone, every day. Call us dreamers but doesn't everyone want to live in a more beautiful place?

**5**

FREE THE BIRDS

► page. This embraces their love of words, introduces their philosophy and explains what they do and why, right off the bat. I suppose the clever part is that, when interacted with, it becomes the navigation. Key words highlighted with italics entice the visitor to hover, instigating a two-stage fade that first removes the non-italicised words to reveal the entire nav and then removes the other italicised words, focusing attention on the link you're about to click. We think it's a strong encapsulation of their beautiful thinking approach and they immediately responded to it, which ultimately led the direction of the rest of the project.

#### How did you execute the text fade effect on the homepage?

**CB:** This was done with simple HTML and CSS transitions. However, the timings, readability and intuitiveness in encouraging the viewer to use it as the nav proved trickier. It took vigorous user testing with different groups to get it right. Most of the other transitions were created using CSS3 and augmented, where needed, with GreenSock's TweenLite library.

#### What other technologies are running the site?

**CB:** Giving the content centre stage and stripping away unnecessary clutter was key to the website's aesthetic, so we focussed on the use of cleanly written HTML, CSS and Vanilla JavaScript. We also took advantage of PJAX to allow for smooth navigation and help enhance the user experience.

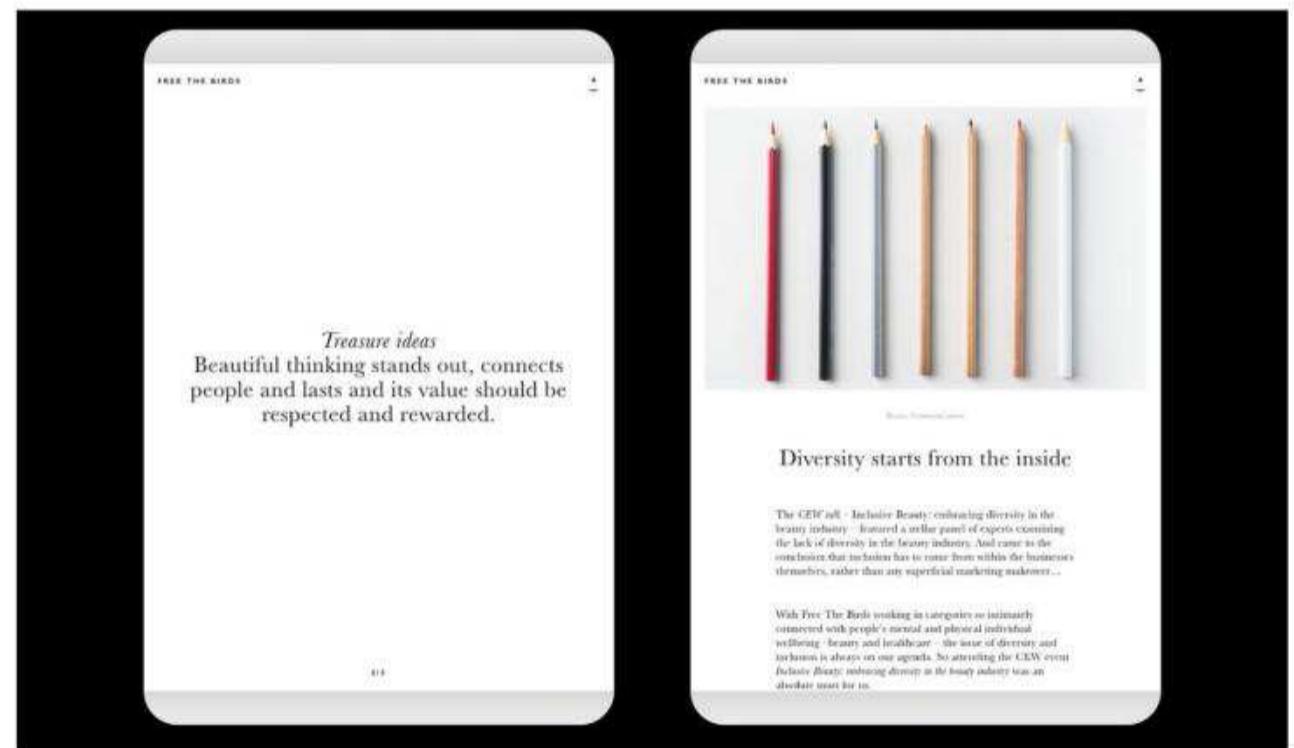
Other than that this was, technically speaking, a relatively simple site but that's part of the beauty of it.

#### What was the biggest challenge you faced during this build?

**CB:** One crucial element was to ensure we retained the SEO performance, which included porting across a significant amount of content from the previous site's blog. For any business it's just as important to us that a site performs brilliantly as well as looks fantastic and we're proud to say we achieved that.



**Above** Mobile view of the homepage and an article from within the Thought page; the tight grid design meant extensive tests had to be carried out on all platforms to ensure all pixels were aligned



**Above** A view of the Believe page and an article from within the Thought page on an iPad. A lot of content was ported from the previous site's blog

#### It looks like testing the site should have been simple. Was this the case?

**MB:** Retaining the grid and tight typographic elements while ensuring the site still worked on mobile devices required extensive testing. With such a tightly gridded design even a misalignment of a pixel stands out, so it had to be bulletproof.

#### Now the site's live, what sort of feedback have you received?

**MB:** All positive... so far! The site

launched on the same day the rebrand was announced in Design Week and the client moved into new premises, so it was fairly hectic for them and we pulled out all the stops to support them.

I think that we have achieved something great with this piece of work; from our original vision to initial concept to final result, it has been a creatively rewarding project. It is safe to say that we are all very proud with the result and I think we've created something rather beautiful. ■

# FEATURES

Become a UX testing expert

# BECO

# TESTING



AUTHOR

JOSHUA GARITY

Garity has worked with some of the world's top organisations to refine and implement user experience strategies for nearly 20 years. Candorem, his UX-focused USA-based agency, has earned more than 40 industry awards in the last five years.

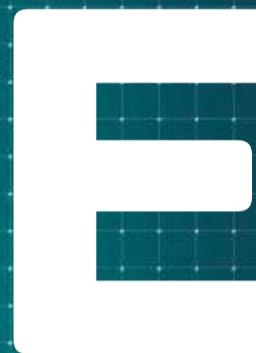
w: [www.candorem.com](http://www.candorem.com)

t: @iamlucid

# Become a UX testing expert

# MEAN UX EXPERT

UX expert Joshua Garity shares his experience to reveal the questions you need to ask and the procedures you need to follow when it comes to composing effective UX tests



valuating the success of user experience strategies in a project requires

a deep understanding of why decisions were made and what core goals motivated the project in the first place. Purpose is what provides context to data. Without that context, the data you review is always going to be clouded with your own personal bias and assumptions.

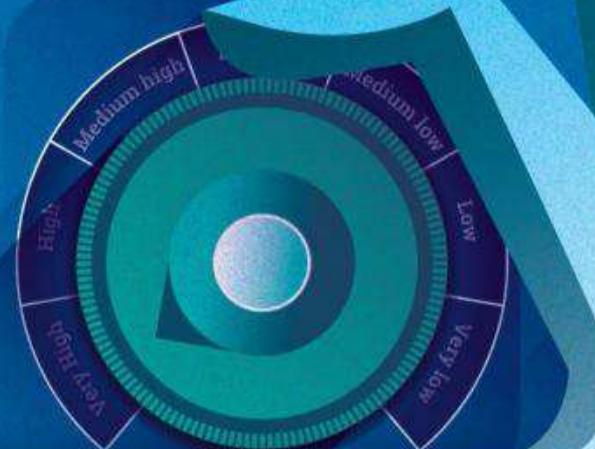
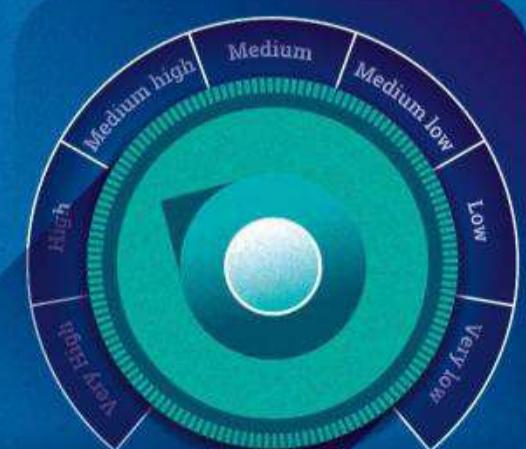
It's why all of those impressive unauthorised redesigns of websites like Facebook that make the rounds every year mean absolutely nothing. Making something better is often based on opinion. I once worked with a user experience expert – self-proclaimed of course – that would frequently try to guide major decisions with opinions and not quantifiable data: 'I don't like using drop-downs in navigation.' User



RUN EFFECTIVE USER TESTS

UNDERSTAND THE RESULTS

FEATURES



► experience strategy is selfless. It's not about you or me. It's not even about the stakeholder in the department asking you to improve something. It's about the organisation's clients. The customers that spend their hard-earned money on the company's products or services.

User experience is about understanding their needs and assessing the best way to accomplish those goals with the resources currently available. You will never have enough time, enough budget or enough teammates with just the right experience to do something the way you may want to.

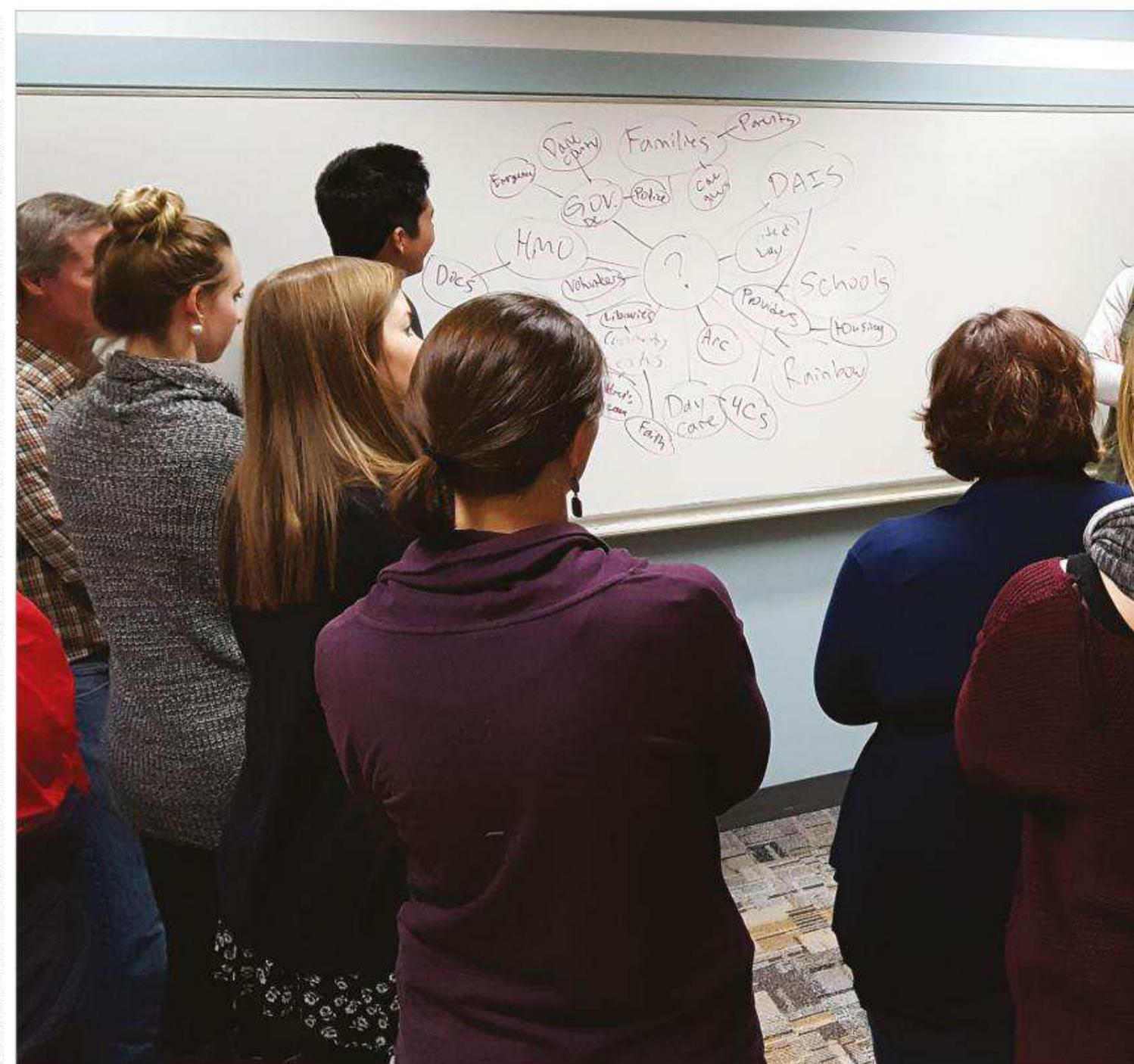
So, how do we start this journey? Good. We're glad you asked.

### Determine purpose of tests

One of the most difficult aspects of effectively testing anything is understanding the purpose behind the request. Why are you currently being asked to test anything at all? In many cases the organisation only recently began to find value in user experience, likely driven by a past failure, but doesn't know where to begin.

Failure is a powerful instigator. Within the framework of testing it's inherently positive and one the most important aspects of what we're talking about here. It defines what needs to be fixed. It adds context and guidance. It's the bridge toward the success we're seeking. Failure can be recognised in its various forms: lost revenue, cancelled membership accounts, high bounce rates on landing pages, abandoned shopping carts, expensive marketing campaigns that don't convert or maybe a recent redesign that looks incredible but no longer generates as many leads.

We're going to let you in on a secret. It's going to make your job as a fledgling test facilitator better the moment you read it and accept it. Ready? The purpose of a test is not for you to determine. That's not your job. It doesn't matter what you want to test, nor does it matter how much better you think you can make that one thing. Being proactive is great but you need to rely on your team lead, manager or stakeholder on a project to set the purpose of a test.



**Failure defines what needs to be fixed... it's the bridge towards the success we're seeking**

If one of those people cannot provide adequate guidance, here's a quick set of questions you may ask them:

- **What is the motivation behind wanting to conduct this test?**
- **Who is the customer you are trying to reach (age, gender, likes and dislikes)?**
- **What would you define as a successful result for this testing? Are there key performance indicators (KPIs) that we need to track?**
- **Is there a set date for when the success needs to be realised?**

Once they can answer those questions you will have what you need to start.

### Benchmarking data to show quantifiable change

Chances are you will be using Google Analytics to capture and review data as it's currently installed on over half of all websites. In larger organisations you may run into New Relic, Quantcast, Clicky, Mixpanel or Adobe Marketing Cloud, among others. The platform doesn't matter as much as the strategy behind what we're doing.

# Become a UX testing expert



**Above** Test participants likely aren't familiar with your organisation, product or goals. Set the expectation and motivation as to why they are on the website

**Left** People's attention is fractured. It's why images, graphs, videos and even memes are so popular. They convey a lot in very little.

## THE REAL ROLE OF UX TESTING

You will often play the role of a mediator between what customers want or expect and what a stakeholder is trying to push internally. When there are loud voices in the organisation, there is a very real pressure on departmental employees to appease those loud voices to keep things moving for political reasons. Your sole job is to use the data from your tests to inform, educate and push an organisation in the right direction and away from bias.

Earlier this year my agency was asked to facilitate a set of competitive analysis tests. We tested three websites. The first was a progressive design similar to the trendy layouts you see floating around sites like Instagram or Dribbble. Another was a site that had more of a utilitarian approach; not flashy or clever in design. The third was the client site that rested comfortably somewhere in the middle.

'Everyone's assumption was the trendy design aligned with the customer far better than the others and the client's site would test the worst. Fun fact: clients always feel their sites are bad but tests prove it's typically more about lack of attentive guidance to implement ideas properly. They just need a nudge.'

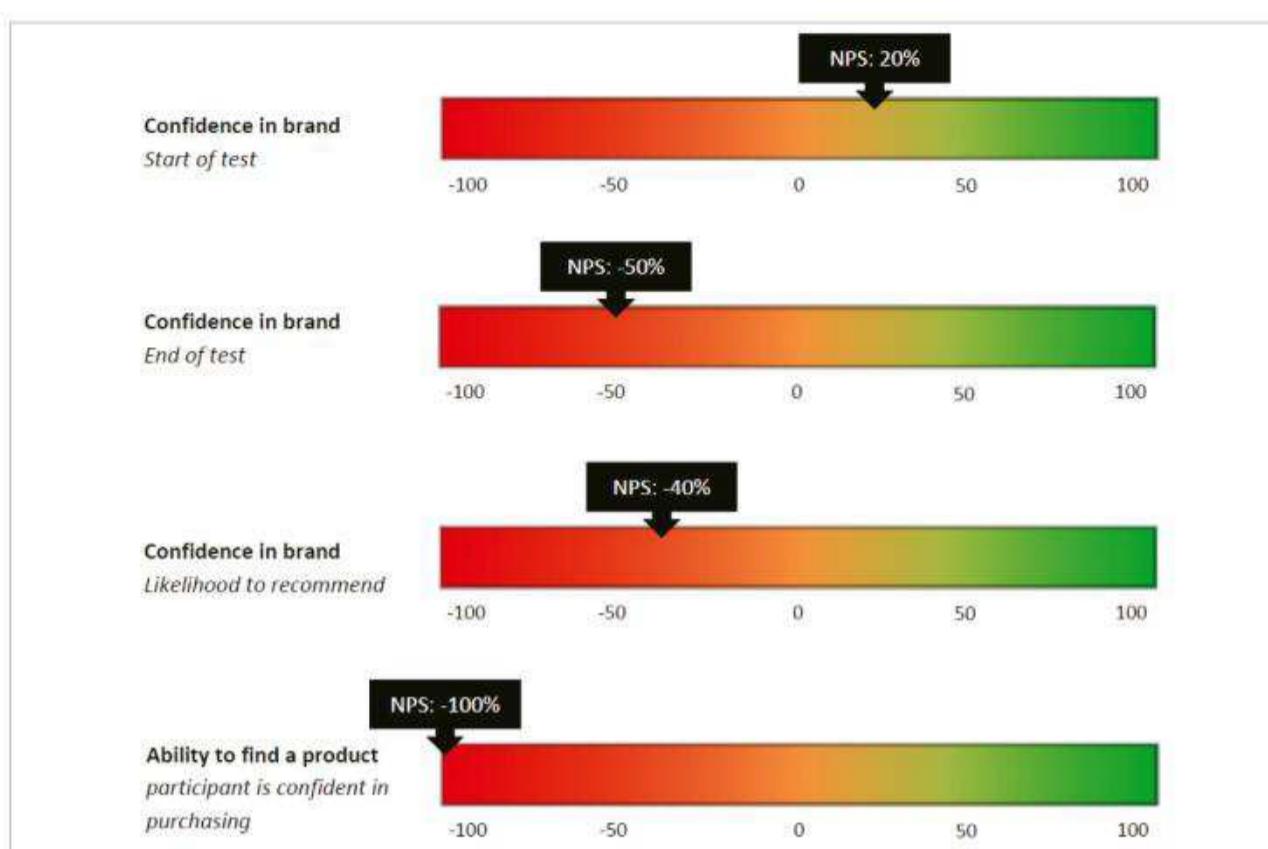
The results came in and guess what? The trendy website had the highest first impression scores but as the participants used the site their trust quickly eroded with each task. It looked great but participants couldn't find any of the important information to inform their buying decisions. It lacked UX strategy.

### UNDERSTAND THE RESULTS



# FEATURES

Become a UX testing expert



If the organisation already has one of those solutions installed, you can jump in and look at data immediately. If not, it's worth installing one and collecting data for 30 days. If the website or application has hundreds or thousands of visitors each day, it's possible to jump in to analysing data earlier than 30 days. Use your best judgement.

Although the data adds contextual clues as to what is happening, remember that you only have one side of the story. You have the result: visitor came from site X, went to page Y, viewed product Z and then left after 36 seconds. But wait. What does that mean? Why did that visitor behave that way? You'll never know with this solution and that's okay. That's not the goal. We want to capture and report quantifiable data.

For example, let's walk through everything. Imagine you have a landing page with the sole purpose of lead generation (your KPI). The landing page requires a visitor to fill out a form and click submit. It could be to receive a free resource, sign up for a webinar or join an email marketing list. When the form submits, send them to a confirmation page (or trigger an event for the more technically inclined). Track the number of visitors that go to the landing page and how many go to the confirmation page. That's your conversion rate. The first time

you track that information it becomes your benchmark. This will be used to gauge the success of all future changes to UX strategies on this page.

If you change copy on the landing page to better address the needs of your customer and the conversion goes up, then you know that your change was a positive one. Easy, right? Everything you need to get started with benchmarking, regardless of the platform, should stem from that core model. It can be filtered by domain, geography or ad campaign. It's incredibly powerful and very easy to showcase change.

The most important aspect of showing success in UX strategies is the change in benchmarked data after you implement change. Data is the currency in which UX is funded. That goes for freelancers, agencies or departments within an organisation. Prove the value of what you're doing.

## Compose effective UX testing plans to achieve goals

One of the most difficult aspects of setting up successful testing solutions is to not fall victim to the villain of personal bias. It can creep in when you write a testing plan or when you review the data. So how do you craft an effective testing plan? It's all about writing simple tasks with a clear focus.

This section shows two parts of an Amazon website. On the left, under 'Business & Office Electronics', there's a 'Computers & Routers' category with a sub-section for 'Amazon's Choice' featuring a laptop. On the right, there's a large image of an open Amazon delivery box.

A screenshot of a web-based tool for selecting a target audience. It includes fields for 'Participants from our panel who match your requirements will do your test.', 'How many participants do you need?', and demographic filters for age, income, gender, and location.

A screenshot of a Craigslist search results page for 'madison, WI'. The results are categorized into various sections like 'community', 'housing', 'jobs', and 'services'.

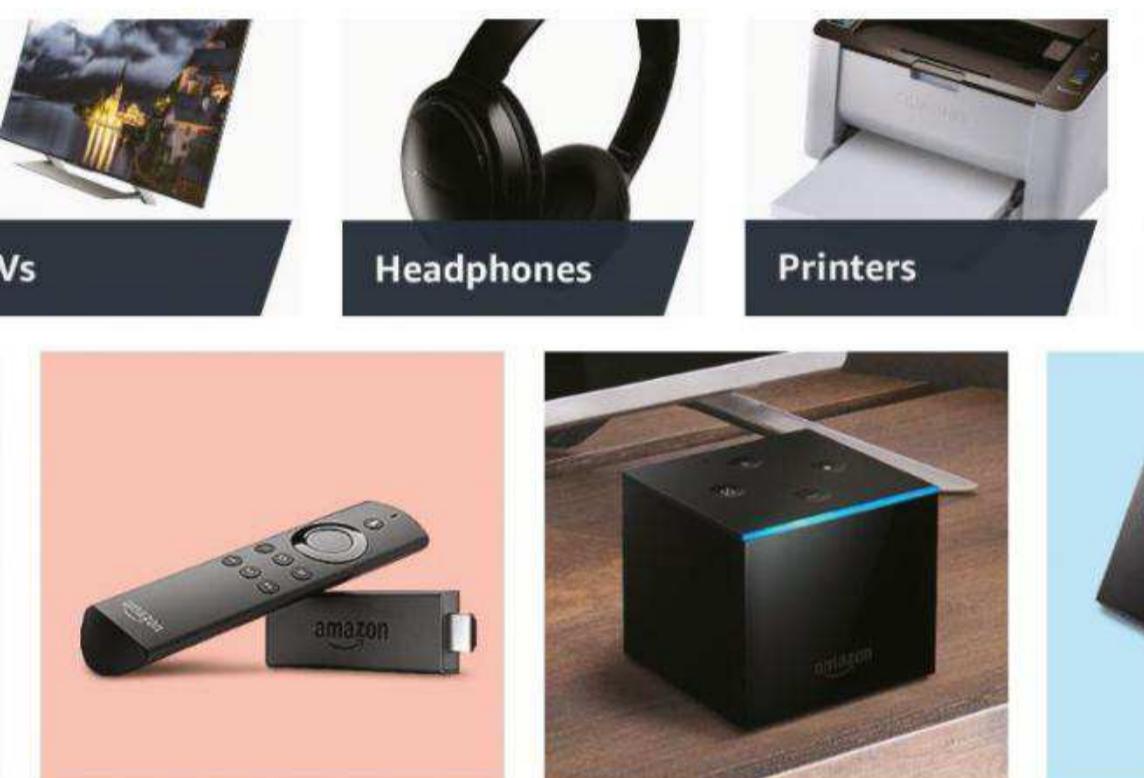
# Become a UX testing expert

Premium Picture. Endless Entertainment. Pair 4K picture quality with Dolby Vision HDR for a superior TV experience on TCL's new 5-Series.

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Shop smart laptop I

**Far left** Don't let trendy designs dictate the success of your website. Pay more attention to the business goals. Because test results.

**Left** Amazon's rule over the ecommerce world is based purely on numbers and not UX strategy. Don't assume others do it right. Test it.

**Middle** UserTesting.com's target audience form can be used as a quick outline for information to ask stakeholders before the testing

**Bottom** Don't confuse utility with bad design. Clarity is key. Craigslist has proven that focusing on form and function is a valuable tactic.

## UX TESTING SOLUTIONS



### UsabilityHub

[usabilityhub.com](#)

UsabilityHub's key value proposition is "Settle design debates with data." You can't beat that! A great alternative to more expensive remote user testing solutions on the market. It offers solutions for five-second tests, click tests, surveys, navigation tests and A/B preference tests.

### Userbrain

[userbrain.net](#)

Userbrain attempts to streamline the user testing process for smaller teams or professionals just getting started with UX testing. You can input a web URL and write a simple task. Userbrain takes care of the rest by recruiting for you and sending you recordings, five to 15-minutes long, that you can watch any time. A great way to get your feet wet with testing.

### UserZoom

[userzoom.com](#)

This is a more robust option for testers that have a firm grasp on what data they need and how to capture it. If you use multiple solutions like User Testing, Hotjar and a survey tool, it would definitely be worthwhile to look into consolidating everything into a tool like UserZoom. It also has the ability to test grouping expectations for navigation or categories (card sorting) among others.

### Hotjar

[hotjar.com](#)

Sometimes you don't need task-based remote screen recordings and you just want raw, anonymous data. If that sounds exciting, this tool is for you. Capture feedback from standards like heatmaps and conversion funnels to feedback polls, surveys and anonymous screen recordings on your site. You can set up a chat-like widget for quick surveys, recruitment or general support. You owe it to yourself to at least try this out.

The most important aspect of showing success is the change in benchmarked data

#### Set a clear use case to begin the test

Test participants likely aren't familiar with your organisation, product or goals. Switch to storytelling mode for a moment and set the expectation and motivation as to why they are on the website. Don't start with questions or tasks right away.

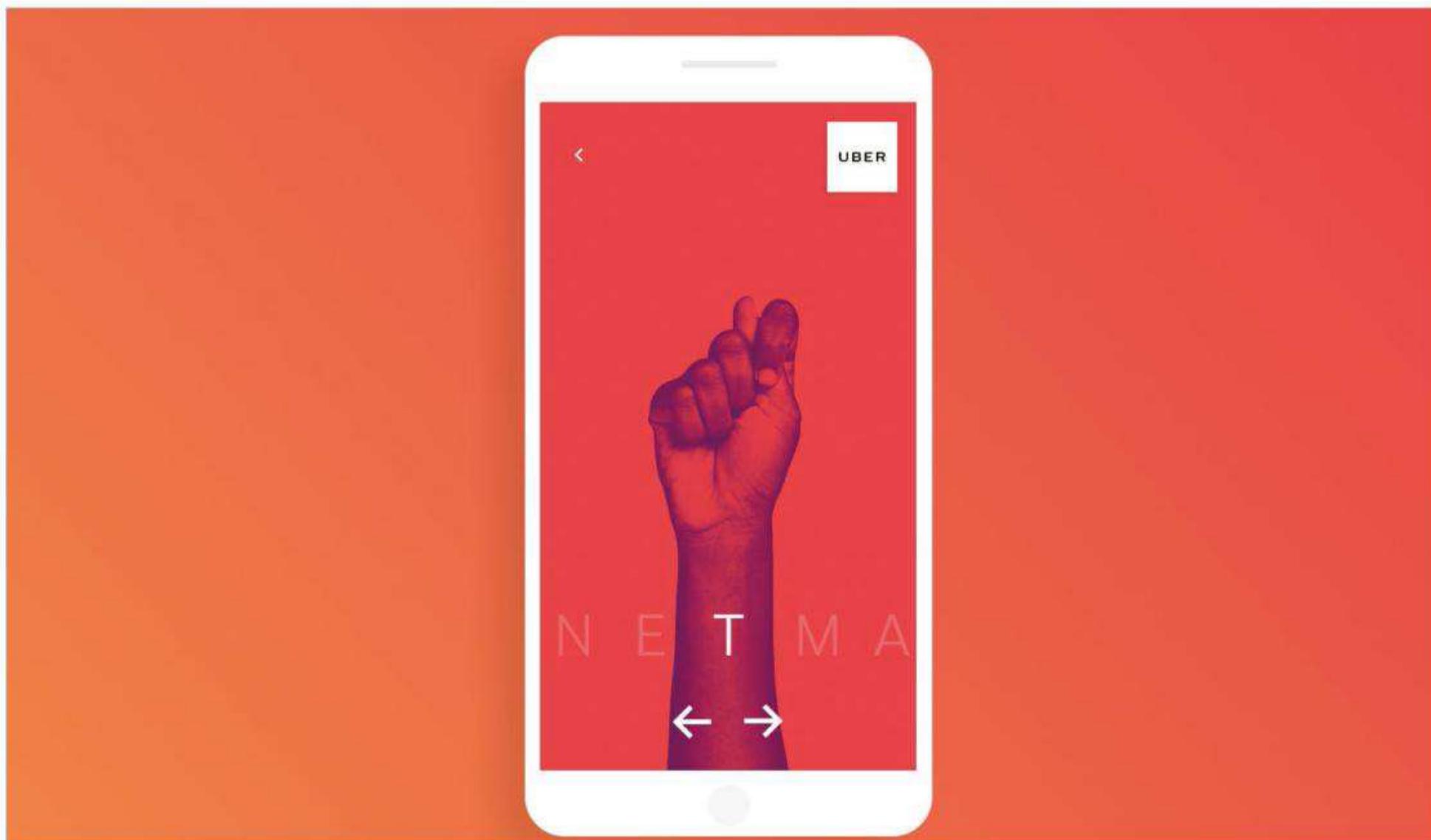
Remember that the testing participants are roleplaying in some ways. They may meet the demographics of your customer but they may not actually be a customer. Asking them to go find this product on your site becomes purely a 'click it until I find it' experience. There won't be any comprehension or investment, which makes your data questionable at best. Explaining to them that they're an avid

mountain biker that has trouble riding in the rain because they don't have disc brakes and their goal is to find a set of disc brakes that can be installed on their 26" bike adds purpose. It adds context.

#### How many users to test

Jakob Nielsen of Nielsen Norman Group, a well-respected evidence-based user-experience consultancy, suggests that elaborate usability tests are a waste of resources and that the best results come from testing no more than five users.

The problem with this logic is that five participants only show trending data when you can compare it to a larger group size. I've uncovered valuable feedback



► on tests after the initial five participants were recorded in nearly all the tests I've done. Even when nothing new arose, having another 10 participants to provide supporting data made the final reports that much stronger.

If you are given an option, try 10 participants for each test and platform, such as mobile, tablet and desktop. It may be valuable to separate by parameters like gender or age as well. Any important customer segment should be treated as a new test to keep the data focused.

Screener options are also important to keep in mind in order to qualify your participants. I recently conducted a test with 45 participants to run a competitive analysis on performance disc brake manufacturers. The focus was placed on mountain bikers that had previous knowledge of performance parts. Some of the questions had fake answers, improbable options and if a participant selected one at any time they were removed from testing. As participants are paid, there is a certain level of potential dishonesty that comes into play so that

## “Emotional response is dictated by personal experience that will not speak to your customer base”

they can be accepted into the testing. Keep them honest or you will get useless data that may send you in the wrong direction and jeopardise your position.

### Quantitative over qualitative

Although it's easy to capture emotional feedback (qualitative) by asking what people feel about something or what they liked/disliked, you're working with a biased perspective of a very small group size. Emotional response is dictated by personal experience and that will not typically speak to the volumes of your customer base. You run the risk of receiving a lot of, 'I don't like these images' or 'it's too dark of a design' that contrast against 'I really like these images' and 'this dark design is great'.

While entertaining at times it doesn't provide much value.

When asking specific questions that have structured response like yes or no, if they were able to complete a task successfully (also yes or no) or even the much-debated net promotor score (NPS), you receive a value that can be compared to all other tests in the same way that we are able to compare the initial benchmarked data from earlier to itself over time. It's important to remove as many variables for bias as possible.

### Don't influence participants with leading questions

Behavioural psychology dictates that many of us simply mimic others. It's human nature and often entirely

# Become a UX testing expert

When was your last visit to Universal Orlando?

- Within the last year
- Within the last 2-3 years
- 3+ years ago
- I have never visited

→

subconscious. Next time you're sitting at a table with someone, take note of how often you both mimic posture. When it comes to the goal of extracting data from others we must be careful to not guide them toward an answer.

A question may be leading if you suggest they take an action or respond a certain way. For example, 'Visit this website. What do you like about it?' You're leading them into providing very specific feedback. Unless you're testing for how much people like something it's better to reframe the question: 'Visit this website. What is your first reaction?' It's open-ended to enable the participant to answer about anything that stands out first to them. While this is generally qualitative, it can also provide direct insight into what someone notices first as quantitative. X number of participants noticed logo first. Y number of participants noticed promotional box first. Then you could divide each of those down based on participant demographic or their sentiment toward it.

Asking non-suggestive questions like: 'Visit website X. Where would you expect to find Y?' lets the participant explore a website or application in a way that speaks to their own learned behaviour. The goal is to get out of their way and remove any potential nudge into a certain response or behaviour. It takes practice.

## Analysing & reporting results

The purpose of UX testing is to generate potential solutions that will have a very real, positive impact on an organisation.

**Far left** Understand the purpose of your website and the value it can provide others. Focus on that. A great example is [ubersignlanguage.com](http://ubersignlanguage.com).

**Left** Testing doesn't need to be overly complicated. Know what you need and keep it simple.

## UX BLOGS TO FOLLOW

The problem with most UX blogs is that they are heavy on content but light on philosophy. UX as a concept is simple but the purpose of what we do and why is incredibly nuanced. It's important to understand the logic behind certain decisions. Not all methods are equal.



### UX Booth

[uxbooth.com](http://uxbooth.com)

A one-stop resource for interaction design. Learn about design systems, best practices, user testing, philosophy and even the business side of UX. The ongoing content is easy to read like a blog post, while managing to be informative like an educational resource.

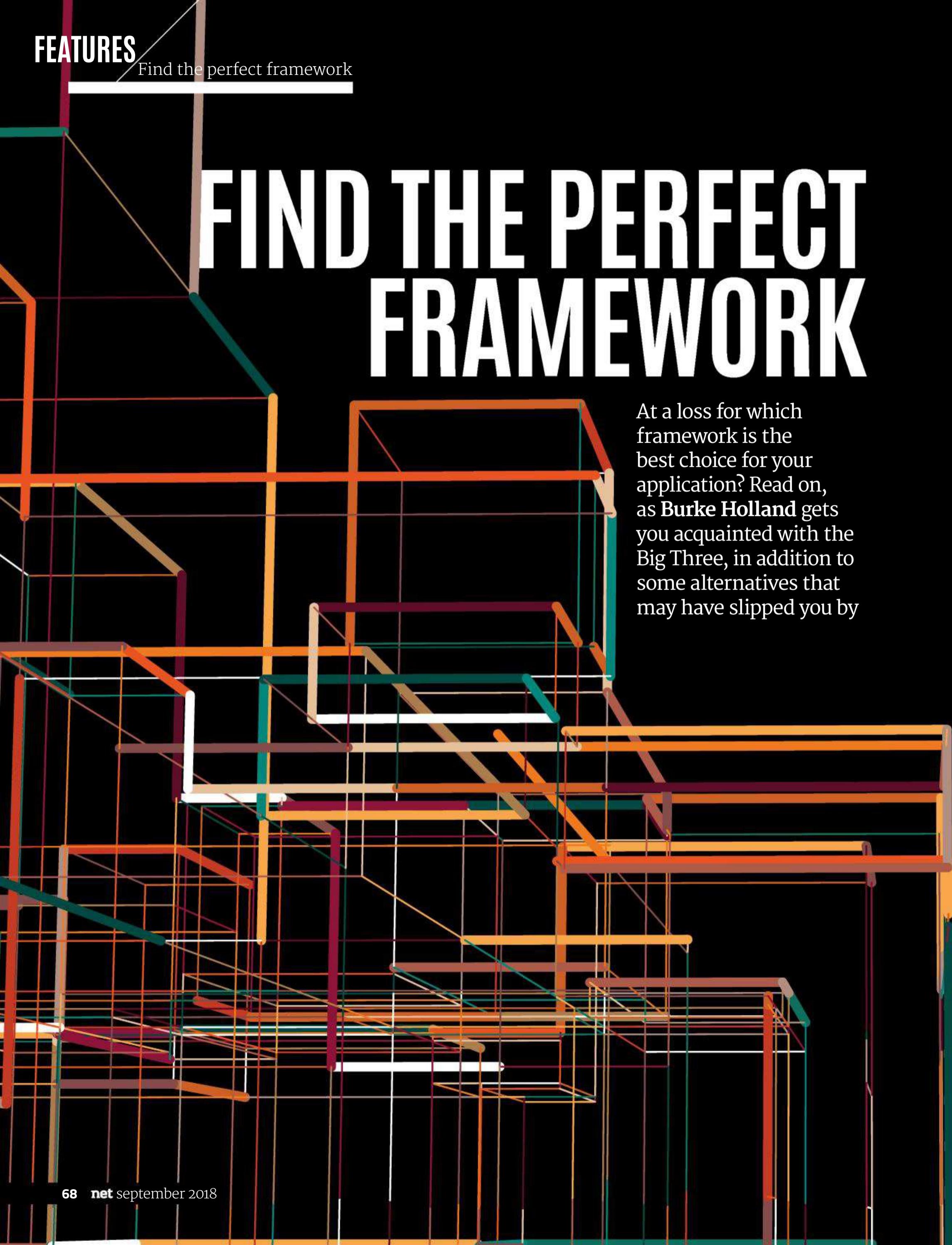


### Nielsen Norman Group

[nngroup.com](http://nngroup.com)

It was actually Donald Norman, a co-founder of NN/g, that coined the term 'user experience' in the 1990s. The group has standardised much of the industry by opening up its findings to the public while giving guidance to others in the same profession. The site offers a deep dive on methodology and understanding while also providing plenty of compiled reports and webinars.

# FIND THE PERFECT FRAMEWORK



At a loss for which framework is the best choice for your application? Read on, as **Burke Holland** gets you acquainted with the Big Three, in addition to some alternatives that may have slipped you by

**T**oday's JavaScript developers building web applications have unprecedented access to a seemingly endless number of libraries and frameworks. When choosing a core framework on which to build an application, it can feel like an overwhelming task to try and hack your way through the jungle of options. And it is a jungle out there.

However, the good news is that front-end development has more or less coalesced around three main frameworks: Angular, React and Vue. We'll call these the 'Big Three'.

Three options is clearly better than three million but a choice still has to be made. What follows is a brief look at the strengths and weaknesses of the Big Three JavaScript frameworks, as well as those of a few outliers. Keep in mind that these lists are always rather arbitrary. What one person sees as a weakness, another might see as a compelling strength. This is why you will see some strengths also listed as weaknesses and vice versa.

Note that all of the Big Three have certain strengths in common that won't be listed individually. Their sheer popularity means that they all have vibrant ecosystems. There is no shortage of third-party libraries – both UI and otherwise. There is also a good chance that if you find yourself stuck and have a question, someone has already asked and answered that question somewhere on a Q&A site or blog. The resolution to any crisis you might find yourself in is likely a short Google search away.

Now we have got all of the appropriate disclaimers in place, let's look at the relative strengths and weaknesses of Angular, React and Vue. ►

## AUTHOR

### BURKE HOLLAND

Senior developer advocate for Microsoft, Holland is a big fan of sarcasm and JavaScript, the latter of which makes him the perfect person to assess the various frameworks available.  
t: @burkeholland

# Angular

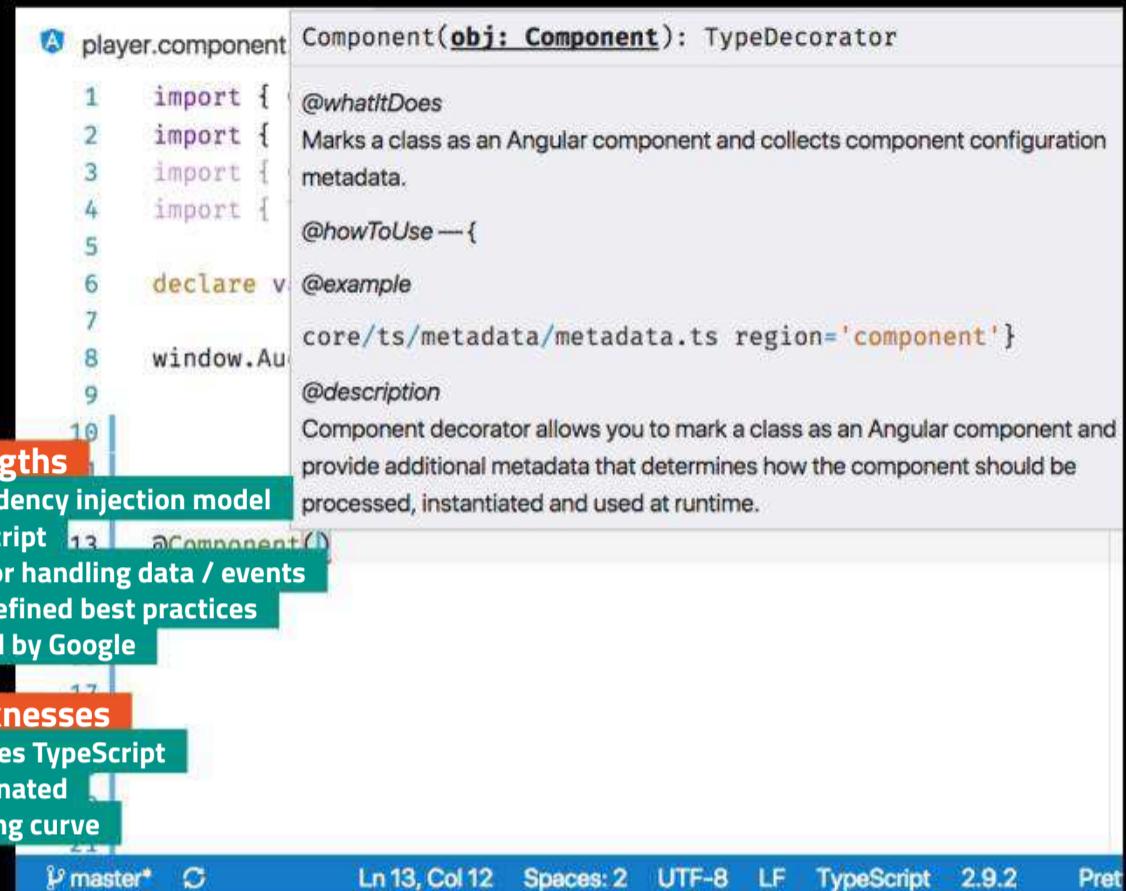
With reliance on TypeScript and DI, could Angular be for you?

Angular is a JavaScript framework created and maintained by Google. Released in 2010, it is based on the concept of dependency injection (DI). Angular quickly gained popularity, specifically among enterprise developers who felt that its DI model made sense for large teams, as well as those moving from other enterprise languages such as C# or Java.

Angular also relies on TypeScript, which provides access to modern JavaScript as well as what might be considered the best developer tooling experience. This is due to TypeScript's type checking, which enables Angular to put the entire framework documentation 'in-line' with a developer's code via editor IntelliSense.

Angular templates can be tricky to debug since they are HTML. Developers may also find that the Angular learning curve is a bit steep given how opinionated Angular is. There is a lot to learn. Some developers may also find those opinions too restrictive for their taste.

Enterprise developers will likely find a familiar friend with Angular but as the team continues to increase performance and bundle size, all JavaScript developers should put it on the list for consideration.



A screenshot of a code editor showing a file named 'player.component.ts'. The code defines a class 'PlayerComponent' with a constructor that takes an 'obj: Component' parameter. The code includes annotations for 'whatItDoes', 'howToUse', 'example', and 'description'. Below the code, there are two sections: 'Strengths' and 'Weaknesses', each with several bullet points. The 'Strengths' section includes 'Dependency injection model', 'TypeScript', 'RxJS for handling data / events', 'Well defined best practices', and 'Backed by Google'. The 'Weaknesses' section includes 'Requires TypeScript', 'Opinionated', and 'Learning curve'. At the bottom of the editor, there is a status bar showing 'master\*', 'Ln 13, Col 12', 'Spaces: 2', 'UTF-8', 'LF', 'TypeScript 2.9.2', and 'Prettier'.

Strengths
Dependency injection model
TypeScript
RxJS for handling data / events
Well defined best practices
Backed by Google

Weaknesses
Requires TypeScript
Opinionated
Learning curve

I was a Django developer for a long time, I think that's why I fell in love with Angular. Like Django, it's batteries-included and opinionated. I like to use frameworks and tools with a lot of opinions, with clever defaults learned through the painful experience of others. If you are building an SPA or PWA today you can't go wrong with Angular.

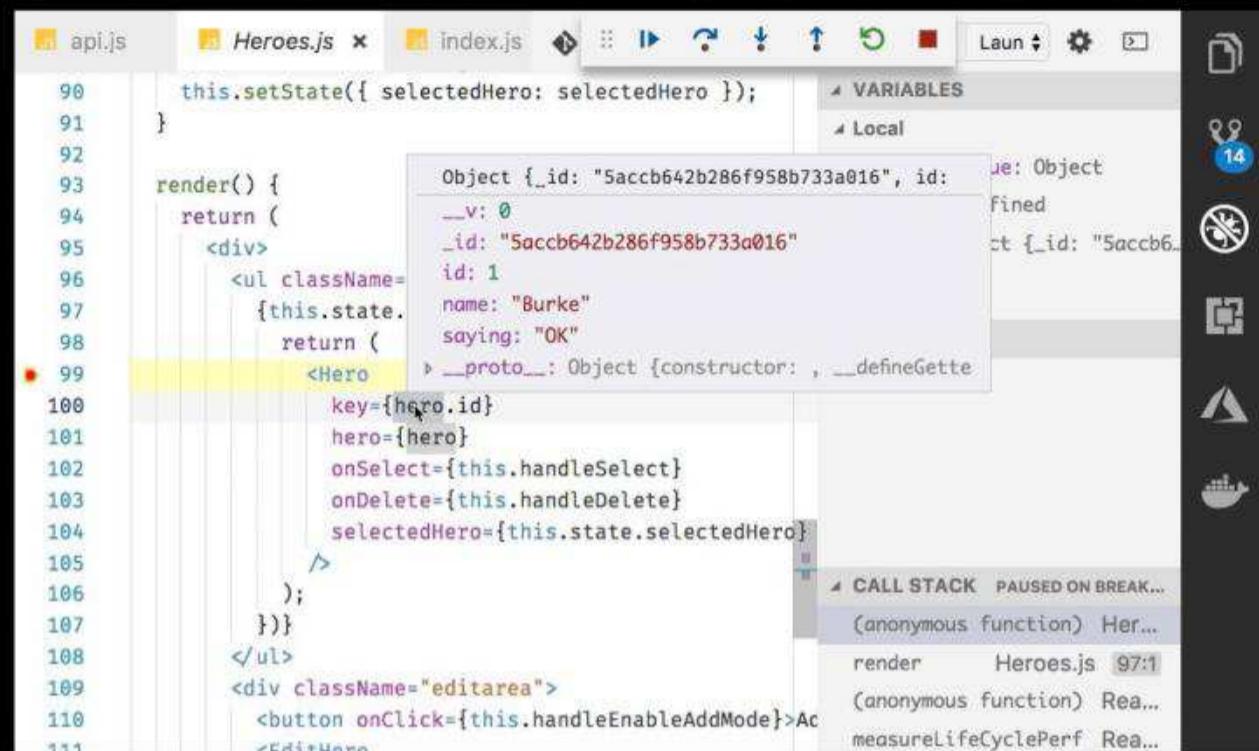
Asim Hussain, Microsoft

# React

Its revolutionary approach has won over lots of sceptics

**React** changed the way developers fundamentally thought about building applications. The core principals behind React are the idea of components and unidirectional data flow. Instead of HTML files or strings, React introduced JSX, which is HTML directly in JavaScript files. Some developers don't like this as it 'feels' wrong but once the initial shock wears off most developers find that JSX is easy to learn, fun to write and simple to debug.

The concept of a virtual DOM was first made popular by React. Instead of updating the HTML whenever changes occur, React tracks a copy of the page in memory and then calculates the minimum number of changes necessary to update the page when its state changes. This state model makes it easier



A screenshot of a debugger interface showing a component tree and state variables. The code editor shows a file named 'Heroes.js' with code for rendering a list of heroes. A tooltip displays a hero object with properties like id, name, and saying. The debugger also shows a call stack and local variables.

```

90     this.setState({ selectedHero: selectedHero });
91   }
92
93   render() {
94     return (
95       <div>
96         <ul className={this.state.isEditMode ? 'editarea' : ''}>
97           {this.state.heroes.map(hero => (
98             <Hero
99               key={hero.id}
100              hero={hero}
101              onSelect={this.handleSelect}
102              onDelete={this.handleDelete}
103              selectedHero={this.state.selectedHero}
104            />
105          ));
106        }
107      </ul>
108      <div className="editarea">
109        <button onClick={this.handleEnableAddMode}>Add Hero</button>
110        <EditHero
111          ...
112        />
113      </div>
114    );
115  }

```

to reason about a UI but it can also make it harder to do things that occur over time in an interface. Animations are the most common example of this.

React is also used at Facebook and Instagram where it has been tested and proven on enormous applications with millions of users on all manner of devices, browsers and connection speeds. This fact alone makes React a compelling option for all JavaScript developers.

## Strengths

- Virtual DOM
- JSX is easy to write / debug
- Battle tested at scale
- Functional programming model
- Innovative

## Weaknesses

- JSX may 'feel' wrong
- Little guidance on app structure
- Harder to do animation
- Ecosystem is almost too big

44

I started using React while at Reddit and didn't care for it. However I discovered that by forcing developers to be explicit about state management, data flows and module dependencies, React is easy to read, understand and debug. Over time we replaced our whole app to React and were thrilled with how easy it was to debug the app.

Brian Holt, Microsoft

# Vue.js

Coming after React and Angular, Vue.js wraps the best of both frameworks in an easy package

The newest of the Big Three JavaScript frameworks is Vue.js. Vue builds on the lessons learned in both React and Angular to provide a framework that is somewhere in the middle of those two. One of the most obvious key advantages of Vue is its simplicity and intuitive API. Developers will likely find the Vue learning curve to be the flattest of all the frameworks listed here.

Vue's centralised component logic puts the HTML, JavaScript and CSS/Sass for a component all within the same file. This is done without having to inline HTML or CSS into strings. This makes it easier to logically group all resources for a component together in the same file.



```

<template>
  <div>
    <h1>This is my {{ status }} component</h1>
  </div>
</template>

<script>
  export default {
    data() {
      return {
        status: 'test'
      }
    }
  }
</script>

```

Vue is also comprehensive. Its router is included out of the box and developers will find that to build a full application they don't need to add anything to the base Vue provides.

Vue is younger than React and Angular so its ecosystem is not as ubiquitous. Developers may find third-party Vue libraries in various states of production readiness. Due to its reliance on HTML for templates, it can be harder to debug Vue templates at runtime.

## Strengths

- Virtual DOM
- Easy to learn
- First-class documentation
- Centralised component logic
- Comprehensive

## Weaknesses

- Little guidance on app structure
- Template debugging is tricky
- Still maturing

I first worked with Vue because I was hired on a project that used it. ‘Not another framework!’ I said. But then... I was impressed. It was so legible. I could maintain other people’s projects because it was clear to me how everything was being used. I also enjoyed that, because the ancillary libraries were maintained by Vue core, I could count on them being updated in tandem when new breaking changes were made.

Sarah Drasner, Microsoft

# Notable mentions

We've covered the Big Three in this article but it's important to note that they are by no means the be all and end all. There are always new frameworks being built and there are some that are still used heavily in the industry but don't garner as much press as the Big Three.

## Ember

Ember has been around for over a decade now and is used in some form in Apple's iCloud (as the SproutCore framework) as well as at LinkedIn. It has been tried and tested in enormous applications used by millions.

The Ember Data module (<https://github.com/emberjs/data>) is praised for its power and sophistication: modelled after Rails Active Record, it offers a simple interface for persisting database structure in front-end applications.

Some developers will find Ember's strong opinions too restrictive. As with Angular, Ember also has a fairly steep learning curve that can serve as a deterrent to adoption. But it is still a full featured and modern JavaScript framework that has already held up under the weight of enormous consumer-facing applications.

### Strengths

- Handlebars for templates
- Battle tested in production

### Weaknesses

- Opinionated
- Sharp learning curve

## Cycle

Momentum in the explosion of JavaScript frameworks has slowed since the domination of the Big Three but Cycle is one of the newer players to emerge.

Cycle is built on the concept of pure functional programming and streams. It then uses something called 'drivers' to handle what it calls 'effects' that occur in the code. These effects would be things like changes to the HTML.

Cycle is so new that it's hard to gauge its strengths or weaknesses. It also uses a lot of terminology that's difficult to understand. While Cycle says it is easy to learn, it is also difficult to understand what it is actually doing.

Cycle is new, at the cutting edge in its implementation and design. Developers looking to the bleeding edge of JavaScript should keep their eye on this one.

### Strengths

- Precise state management
- Functional programming paradigm

### Weaknesses

- It's new

## Preact

Preact is the minimalist's version of React. Weighing in at only 3KB, it has the same API and the same strengths that React's focus on components brings to UI composition.

While Preact sports the same virtual DOM as React, its 'diffing' algorithm is different and Preact claims it is "one of the fastest Virtual DOM libraries out there".

Preact is not the same as React. It does not enjoy the same adoption that React does and, with its nearly carbon copy API, it becomes less clear why developers might choose a smaller project like Preact over React.

Still, Preact's focus on performance and its minuscule size make it a compelling alternative to developers looking to eke out every last drop of performance.

### Strengths

- Tiny (like itty bitty)
- Can use class instead of className

### Weaknesses

- Same as React
- It's not React

## jQuery

Yes, you read that right: jQuery. The library that arguably vaulted JavaScript into the stratosphere is still around. jQuery is still the easiest way to directly manipulate an HTML page, perform common tasks like Ajax calls and reliably work with collections. Many a developer still pine for the days when one simple jQuery in a page was all you needed to build an application.

It isn't a full framework, though. There is no 'binding' between the HTML and the JavaScript, so state changes are managed by the developer.

But developers should consider jQuery, especially if building applications that are small or inside of runtimes like Chrome Extensions, which often preclude the use of libraries like Vue, Angular or React because of their content security policy (<https://netm.ag/2J02WKI>).

### Strengths

- Simple
- No build step

### Weaknesses

- No 'binding'
- Not a true framework

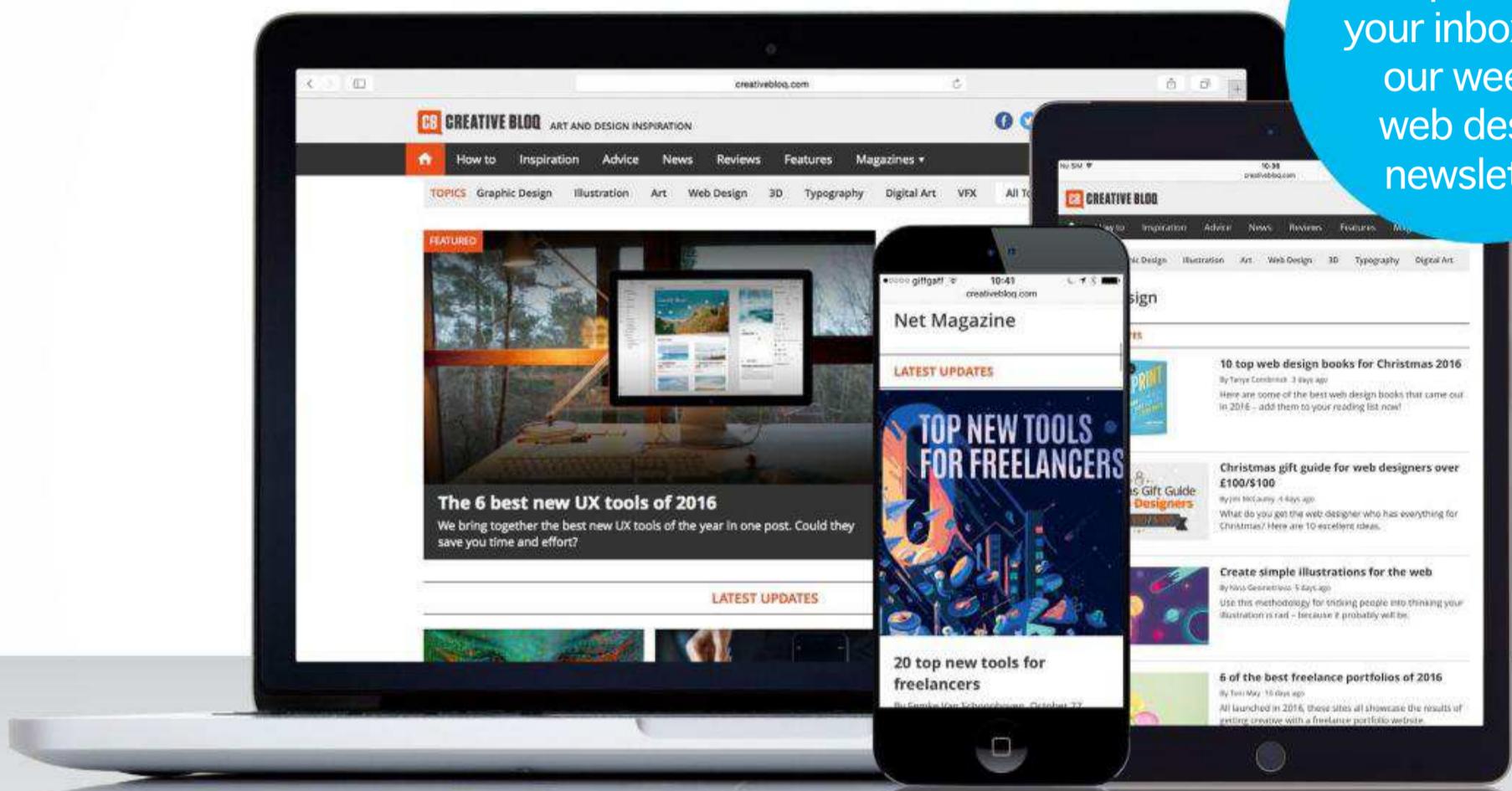
## Picking the 'right' one

There is an enormous amount of pressure to make the right choice when picking a framework upon which to standardise and build your applications. It's a big investment and no small decision. There is no prescriptive answer to the question of: 'which framework should I pick?' The truth is that there is only the framework that works for you, your team and your project.

When it comes to the Big Three, you can take some comfort knowing that it's impossible to make a bad choice. It could be that one of the lesser hyped frameworks such as Ember and Preact might also fit the bill and both are great choices. If you're building a smaller application or Chrome Extension, don't be afraid to pick up jQuery and, for the intrepid developers out there, Cycle might be breaking the very ground that you have been looking to smash yourself. ■

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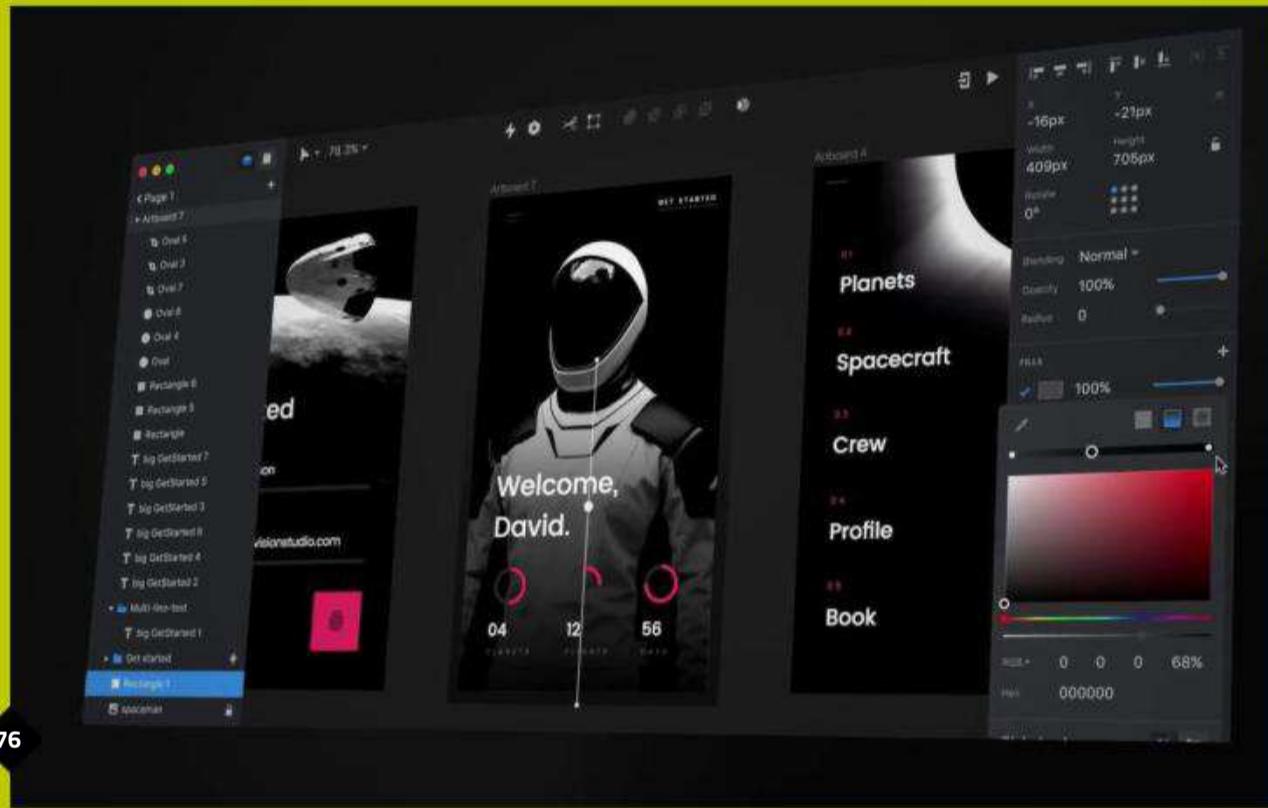
Digital art

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# PROJECTS

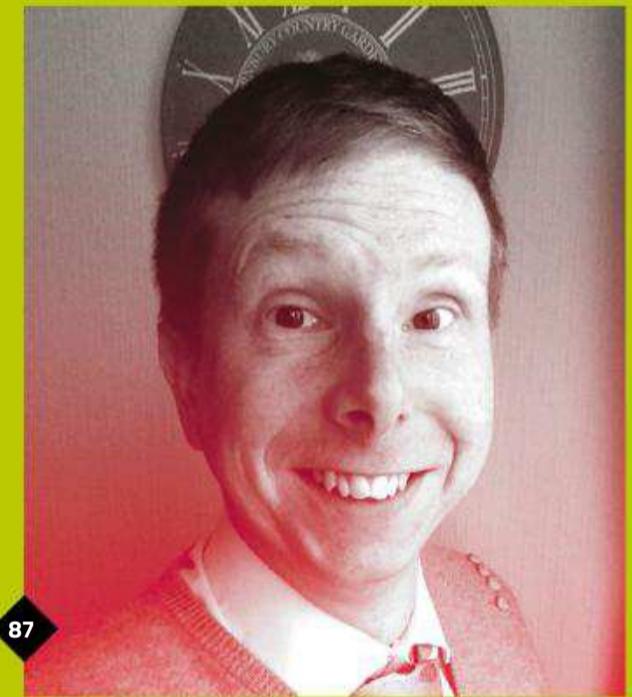
Tips, tricks  
& techniques

THIS MONTH FEATURING...



76

GET TO GRIPS WITH ANIMATION IN INVISION STUDIO



87

AVOIDING THE REACT  
ACCESSIBILITY TRAP

87

A screenshot of the Storybook interface. It shows a news card component with a title "Lorem ipsum" and a "Read More" button. Below the card, there are several configuration options: "ACTION LOGGER", "BACKGROUNDS", "KNOBS", "VIEWPORT", "Title" (set to "Lorem ipsum"), "Description" (set to "Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent finibus sem libero, sit amet scelerisque justo tempor ac. Maecenas pulvinar in ante eu porta. Maecenas ac malesuada arcu..."), "Button Text" (set to "Read More"), and "Image URL" (set to "/image.jpg").

82

DEVELOP REUSABLE REACT COMPONENTS WITH STORYBOOK

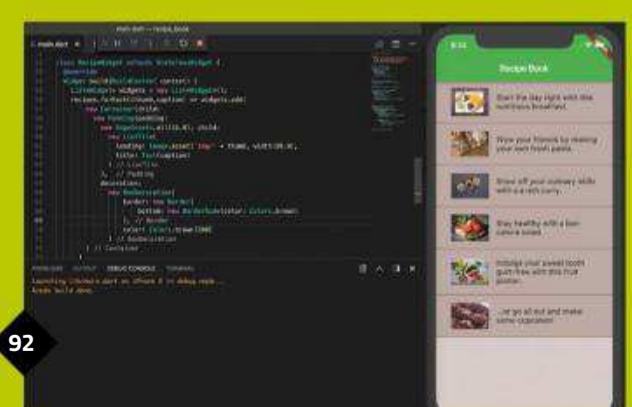
76



88

GET STARTED WITH SHADERS  
IN THREE.JS

88



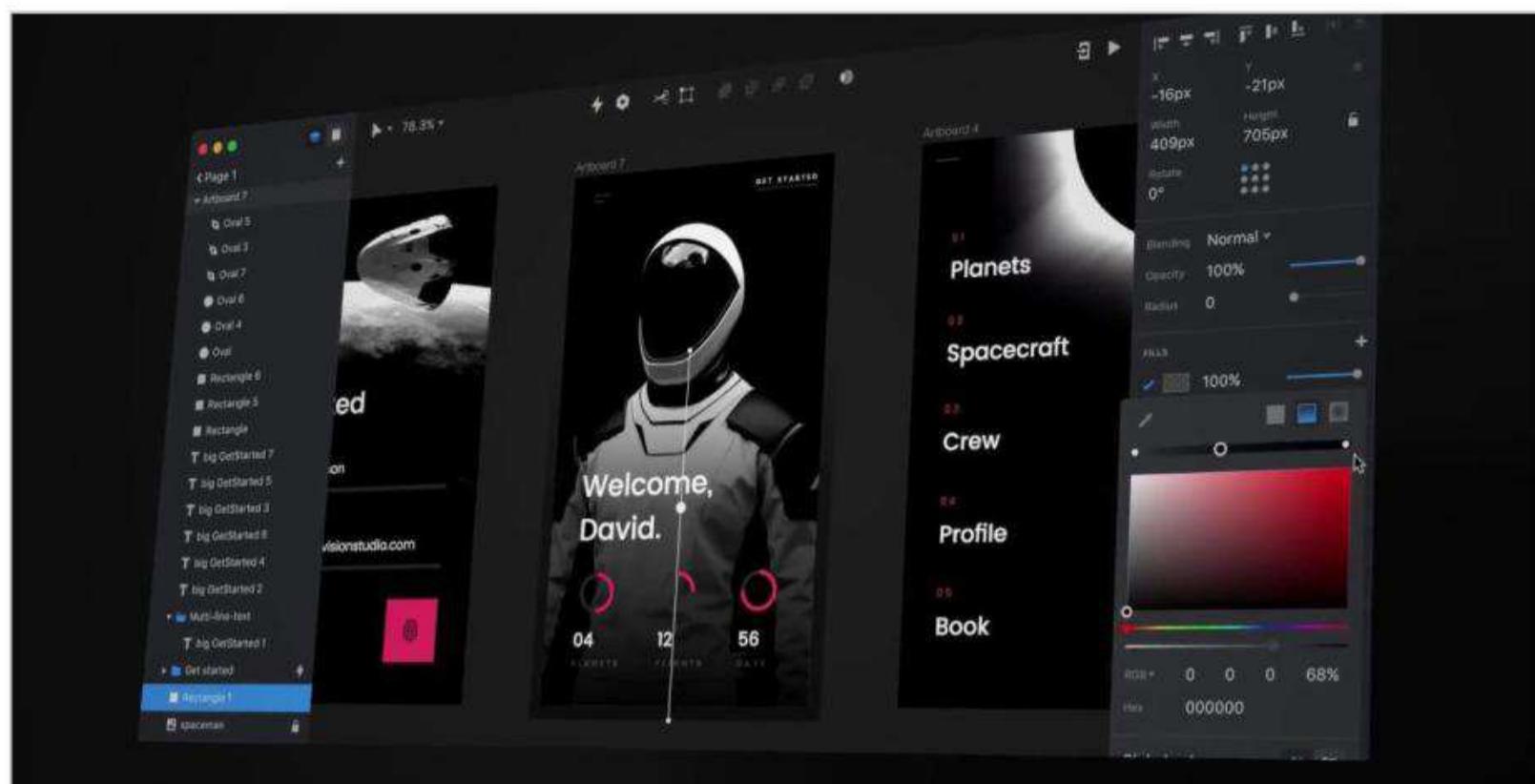
92

TAKE YOUR FIRST STEPS  
WITH FLUTTER

92



## ABOUT THE AUTHOR

**DANIEL SCHWARZ**w: <https://uxtricks.design>job: Founder of UX Tricks,  
design blog editor at  
SitePointareas of expertise:  
Product design, UX, UI

## \* INVISION STUDIO

# HOW TO ANIMATE WITH INVISION STUDIO

**Daniel Schwarz** shows us how to craft advanced animations with InVision Studio's timeline feature

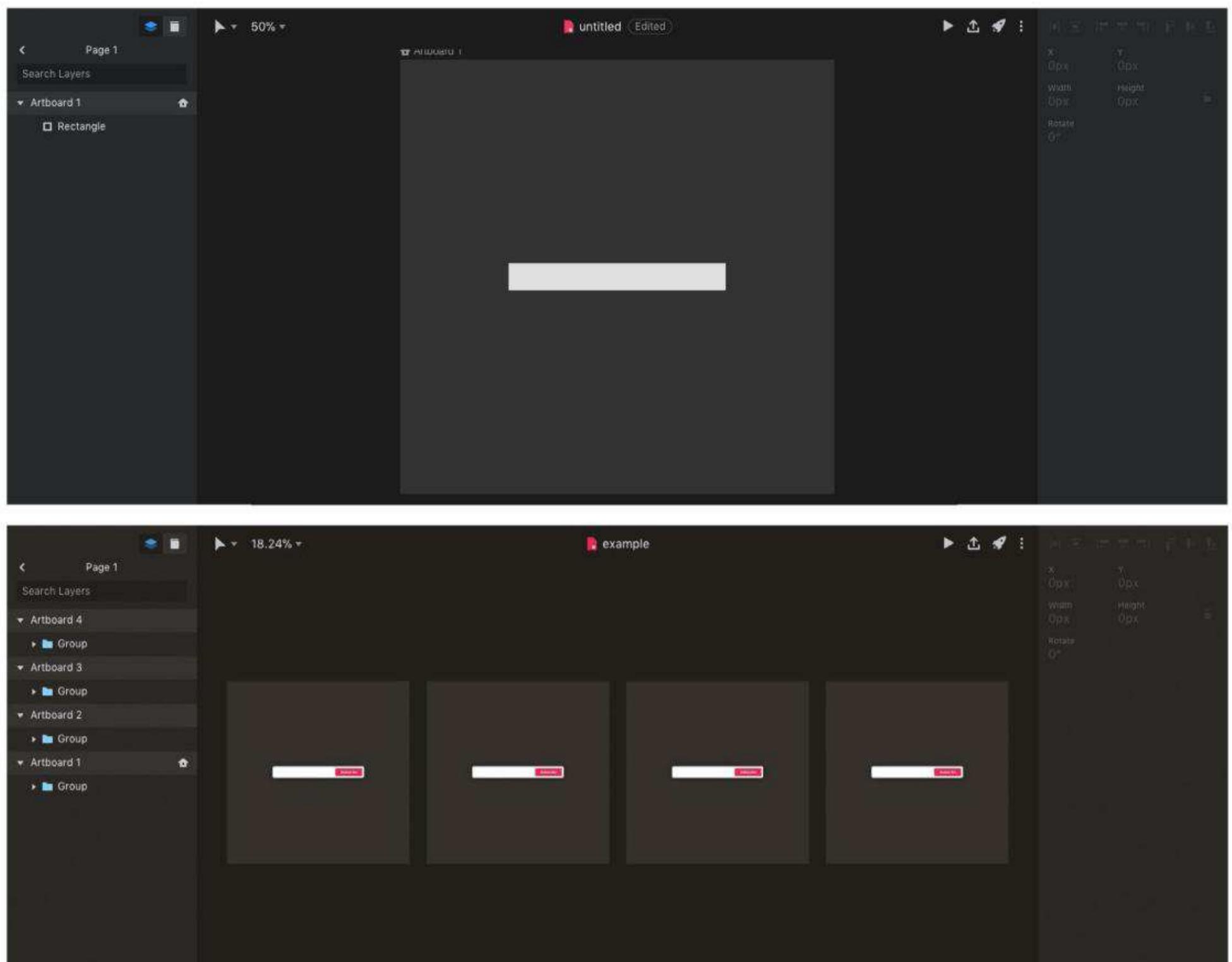
Over the last few years, InVision (<http://invisionapp.com/>) has built incredible tools to supplement its original focus on helping designers and stakeholders to collaborate on interactive prototypes. Handoff tools here, whiteboard tools there, yet somehow InVision has also found ways to lessen the gap between its tools and design apps that designers use (i.e. Sketch and Photoshop).

InVision's new screen design app, Studio (<https://www.invisionapp.com/studio/>), available only on macOS for now, narrows this gap even more by enabling designers to contain their entire design workflow within InVision. With almost instant connectivity to handoff and commenting features, Studio also ships with responsive components, built-in transitions, shared design systems and, finally, timeline animation, terrain unexplored by InVision up until now.

Timeline animation enables UI designers to create advanced animations beyond standard transitions such as slide, push and fade, making micro-interactions more descriptive and the overall user experience far more dynamic and impressive. With timeline animation we can animate several layers in different ways, all at once, each with different easings and durations. In this tutorial, we'll learn how to craft these advanced animations.

## WHAT MAKES A GREAT INTERACTION?

A great interaction accurately describes the result of the user's intent; for example, a form submit could use motion, colour, and/or icons to communicate whether or not the form was filled out accurately. Great interactions also wow and delight, stimulating emotion as the user makes a more meaningful and more memorable connection with the brand.



It's also worth noting that users tend to remember the first and last interactions they have with an app or website (this is known as the primacy and recency effect, which you can learn more about here: <https://netm.ag/2uMvGPH>), hence, a satisfying onboarding and conclusion can make all the difference to app retention or returning customer rates. Clever animation can play a vital role in this.

## IN THIS TUTORIAL...

We're going to create a swinging effect. We use this effect on UX Tricks (<https://uxtricks.design/>) to direct the user's attention towards the call-to-action. For context, this CTA is a lead magnet / subscribe form and the user discovers it after scrolling to the bottom of the web page.

Sometimes it hangs around the bottom edge of the screen (if the user hasn't scrolled enough)

and sometimes the reader is simply looking for something else to do. We don't want to force it upon them, so this swinging animation is a subtle way of bringing it to their attention. The animation makes the subscribe form more noticeable but it's also easy enough to ignore.

Let's get started.

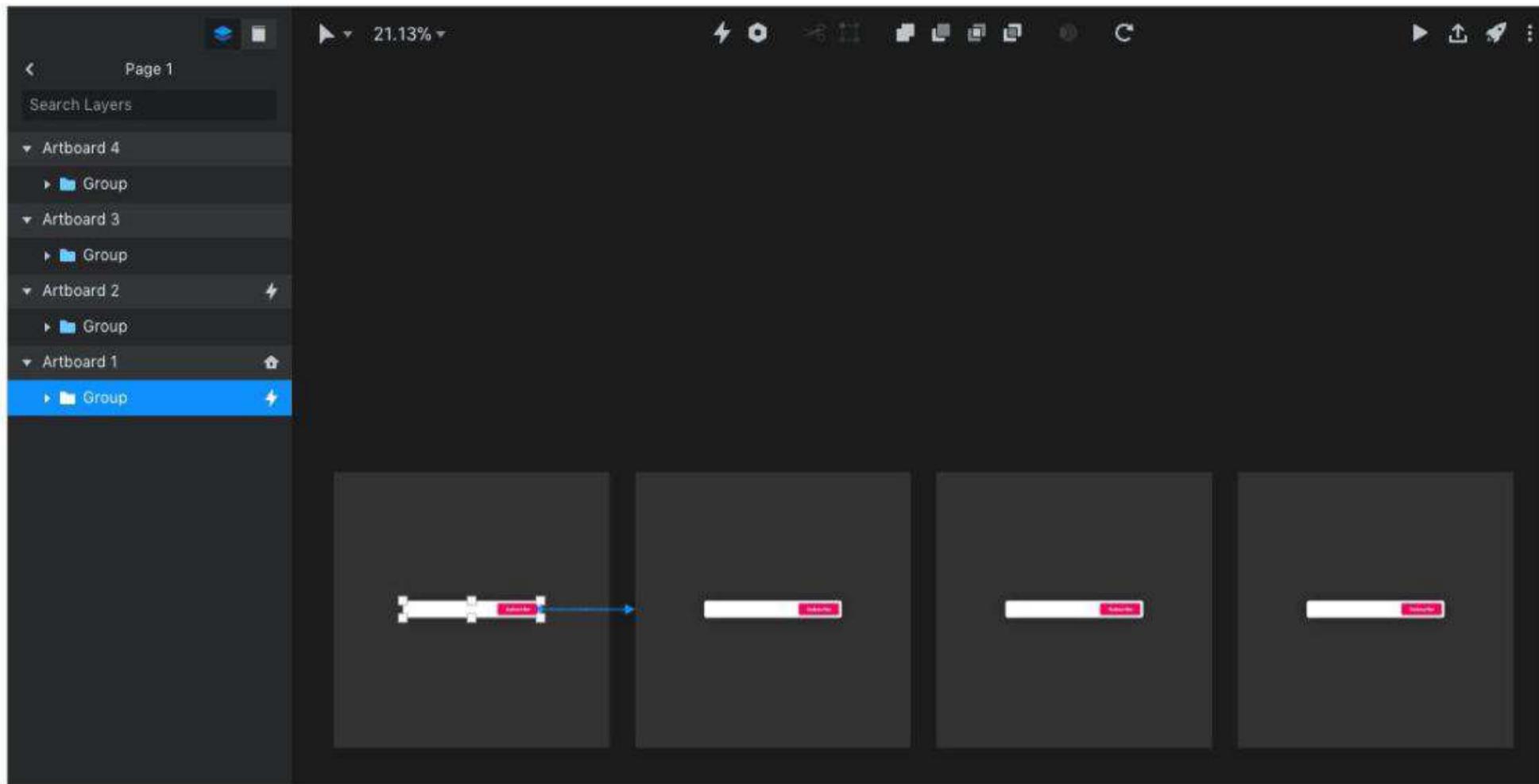
## SET THE STAGE

If you don't already have it, you can download Studio on InVision's website (<https://www.invisionapp.com/studio/>). It's free and this is all we'll need to complete the tutorial.

Once you've installed the app and reached the welcome screen, choose the Blank Canvas option. Ordinarily we would import a Sketch file or choose an artboard but starting with a clean slate and creating an artboard manually enables more options. ►

**Top** InVision Studio's basic screen design tools are lightning fast

**Above** Kicking the process off by defining all the states of the interaction



**Above** Press C to create an interaction from the currently selected object

- In this case, tap the A key and then choose the Desktop artboard. This artboard fits well on our screen and is suitable for sharing on Twitter, if we wanted to collect feedback.

Next, tap R (for rectangle) and draw what will soon resemble a white input field. Then, using the inspector on the right-hand side, set the Width to 50% and the Height to 64px (because tap targets should be at least 44px to meet WCAG 2.0 accessibility standards). Make the input field white, then switch to the artboard and choose a darker background colour.

If you want to take things a step further, creating more shapes and using more styles to design something that looks more like a subscribe form (field + button), that's absolutely fine. If not, this is all that we need to start learning how to design a swing animation.

Please note that if you do decide to create more layers, it is very important that you make sure to group them together (select all layers, then hit Cmd+G on the keyboard), so that you can animate the entire component.

Next, select the artboard via the layer list (or by clicking the artboard name near the top-left corner of the artboard) and then duplicate it three times (shortcut: Cmd+D, which is the same as Sketch). Each artboard represents one defining moment in the animation (original state, swing left, swing right, back to original).

## CREATE THE INTERACTIONS

In this next step we'll link up the states to create a sequence of events (it's fine that they all look the same right now).

Select the object(s) in Artboard 1, then click Interactions from the inspector. We need to ensure it has these settings:

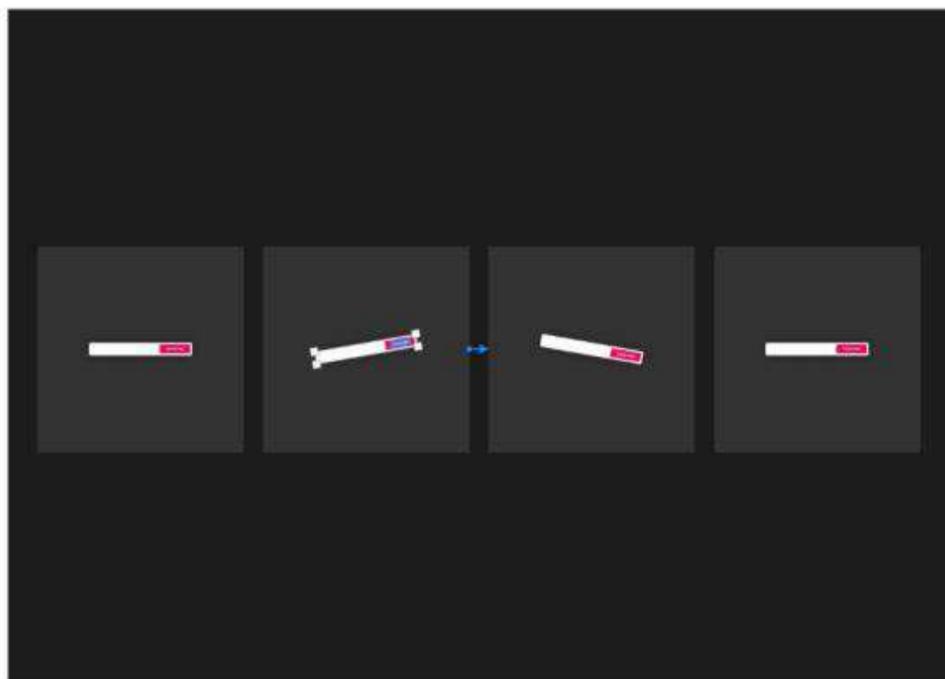
**“With timeline animation we can animate several layers at once, each with different easings and durations”**

- Trigger: Tap (default)
- Navigate to Screen: choose Artboard 2
- Transition: select Motion
- Duration: 0.3s (default)
- Delay: 0 (default)

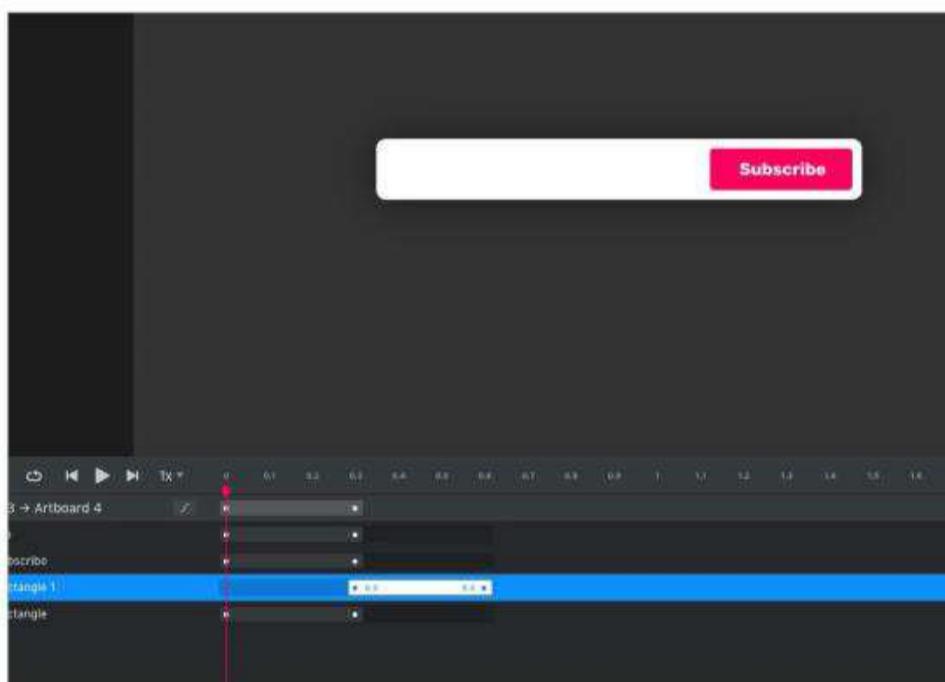
Press C to create an interaction from the currently selected object

Give Artboard 2/3/4 the following settings:

- Trigger: Timer
- Timer Duration: 0
- Navigate to Screen: (whatever the next artboard is)
- Transition: select Motion



Above Creating the swing effect by rotating the object



Above Fine-tuning the interaction with timeline animation

- Duration: 0.3s (default)
- Delay: 0 (default)

Because we are selecting Timer and then setting the duration to 0, what we're effectively saying is that each state should automatically transition into the next with no delay and no further interaction from the user. This is one interaction that has been broken down into states, with each of the artboards representing a state.

Apply the same settings to Artboard 4 but link it to Artboard 1, effectively returning the animation to its original state. If you'd like to establish a continuous loop, you need to apply the same interaction settings to Artboard 1.

## DESIGN THE STATES

Select all of the object(s) in Artboard 2 and using the property inspector, change the Rotate property to -10°. On Artboard 3, change it 10°. At this stage you're ➤

### ★ INVISION STUDIO HELP

## RESOURCES

 InVision Studio is quite new but that hasn't stopped talented designers, writers and even the Studio team themselves from creating epic resources to help us become Studio masters in no time at all. Resources range from tutorials and UI kits to inspiration and vibrant communities for Studio users.

### Studicons

<http://studicons.com/>

The world's first icon set for InVision Studio, designed by Oliver Pitsch. It's quite an extensive set too and won't cost you a penny.

### InVision Studio community

<https://www.facebook.com/groups/InVisionStudioCommunity/>

This Facebook page is quite useful, as the team are always around to answer any questions. It's an ideal place to report bugs too.

### StudioTalk

<https://invisiontalk.io/>

Made by Olivier Heitz, creator of SketchTalk, this is a forum-type community for InVision Studio users. It's a great place to keep up with resources and updates besides the official Facebook group.

### Made For Studio

<https://madeforstudio.com/>

The largest existing hub for InVision Studio resources, also made by Olivier Heitz. You'll find the website is updated with freebies, tutorials and inspiration on a regular basis.

### Hooked

<http://www.studioamigos.com/hooked-invision-studio-free-ui-kit/>

A free UI kit for Studio, designed by StudioAmigos. Check out their other studio resources too!

### Learn InVision Studio

<https://www.learninvisionstudio.com>

New Studio tutorials every week. Sign up to the weekly newsletter, and you won't miss a thing.

### Creating a GIF

Have you ever wondered how savvy Twitterers are creating awesome GIFs of their animations? Watch this video ([https://www.youtube.com/watch?v=TKh\\_9beLPOU&feature=youtu.be](https://www.youtube.com/watch?v=TKh_9beLPOU&feature=youtu.be)) by Kunal Bodke to find out how.

### Tom Giannattasio talks about the early days of Studio

<https://www.invisionapp.com/blog/building-invision-studio/>

The first team members relive how it all happened. Check out the early concept drawings, made with InVision Freehand!

The image shows two screenshots of the InVision Studio interface. The top screenshot displays a 'RESOURCES' section titled 'SCREEN TRANSITIONS'. It includes a list of supported transitions: Instant, Fade in, Slide left, Slide right, Slide up, Slide down, Push left, Push right, Push up, and Push down. Below this, a note advises thinking about user intent for backwards/moving forward transitions. The bottom screenshot shows the 'Edit Timeline' view for a component, with a 'Subscribe' button on the artboard and various animation properties like Opacity, Duration, and easing options visible in the inspector.

► welcome to change any property you like but this is all that's required to create the swing effect. In the next step we'll test it!

## PREVIEW THE INTERACTION

Previewing interactions is super simple. Hit the play icon in the top middle-right region of the app window, where another (separate) window will appear. Just as you would in real life, click the tap target to initiate the animation – this is a terrific way for us to test interactions/animations before requesting feedback on them.

It is also possible for us to connect Studio with InVision Mirror to preview interactions on real devices. The ability to do this is perfect for those times when we'd like to test internally or test with real users. To test on real devices using InVision Mirror, click on the upload icon (next to the play

**“Easings make animations appear more natural by slightly adjusting the speed at certain intervals”**

icon), then click Mirror. Make sure the InVision mobile app is installed on your iOS device, then scan the QR code given by Studio.

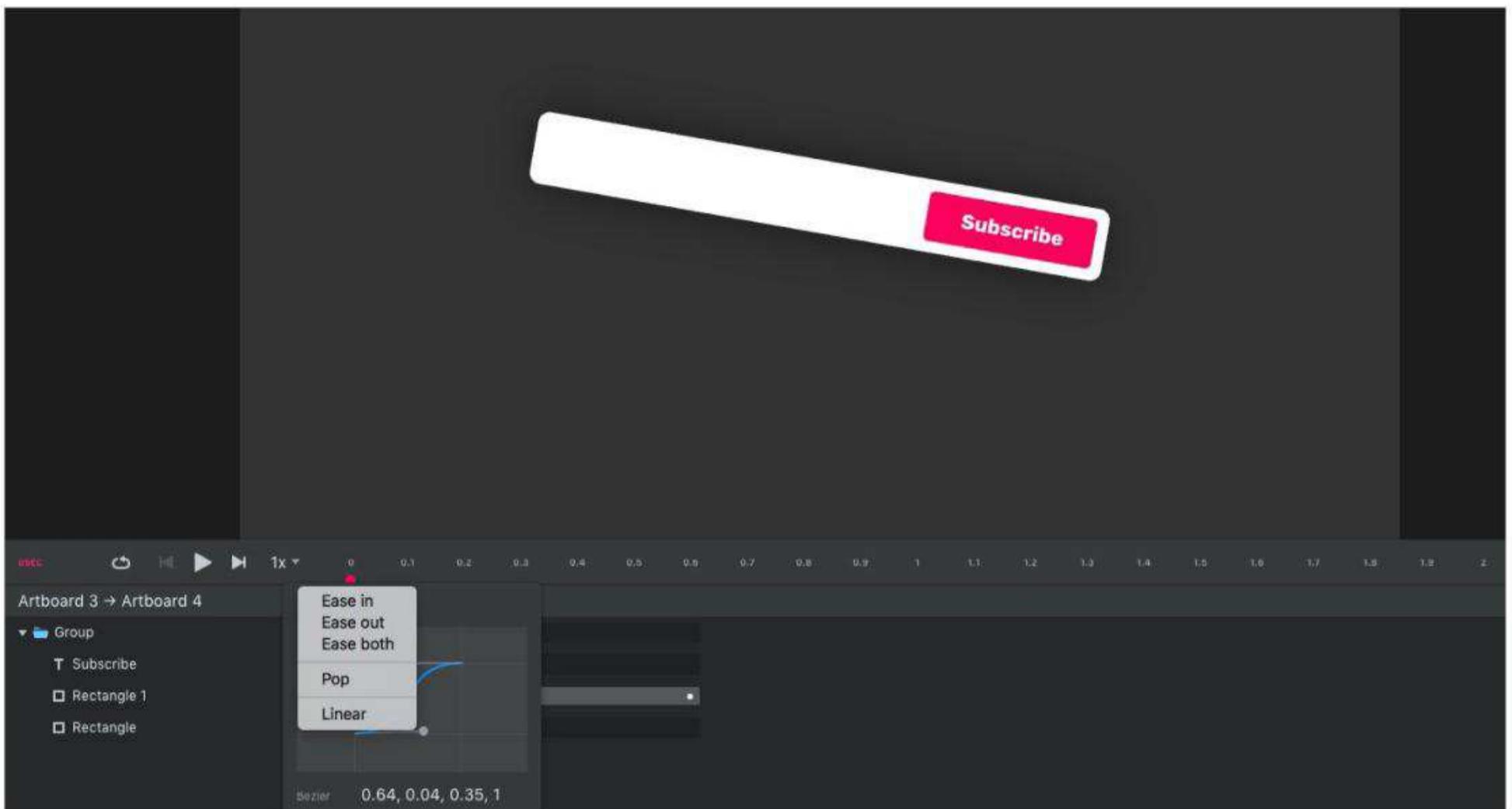
You can pick up the mobile app from: <https://itunes.apple.com/app/invision-design-collaboration/id990700027?mt=8>.

## EDIT THE TIMELINE

Now that we're getting into the swing of things, let's talk about timeline animation. In this step, we'll add one more animation, this time demonstrating how some animations don't require a new artboard when animating more than one property.

Start by using the property inspector to make some changes to the submit button. For example, you could change the Width and Height settings in order to make the button larger. Next, select Artboard 3, then click the Edit Timeline button (under Interactions in the inspector) to reveal the timeline for this transition.

Now, bearing in mind that the Transition Duration is 0.3s, we can use the scrubber (the pink, slidable thing) to see what the animation looks like at 0.1s, 0.2s, 0.3s and everything in-between. As you'll see, the submit button animates while the entire component is still swinging.



By changing the timeline, we can alter when (and for how long) each individual layer animates, creating advanced animations.

On the timeline, expand any groups to reveal layers within that group. The animation applied to each layer can be stopped and started at any given time, by adjusting the individual layer's timeline. Adjust the submit button so that its animation starts at 0.3s (which is when the swing finishes) and ends at 0.6s. To clarify here: the first 0.3s is allocated to the swing, the remaining 0.3s to the button.

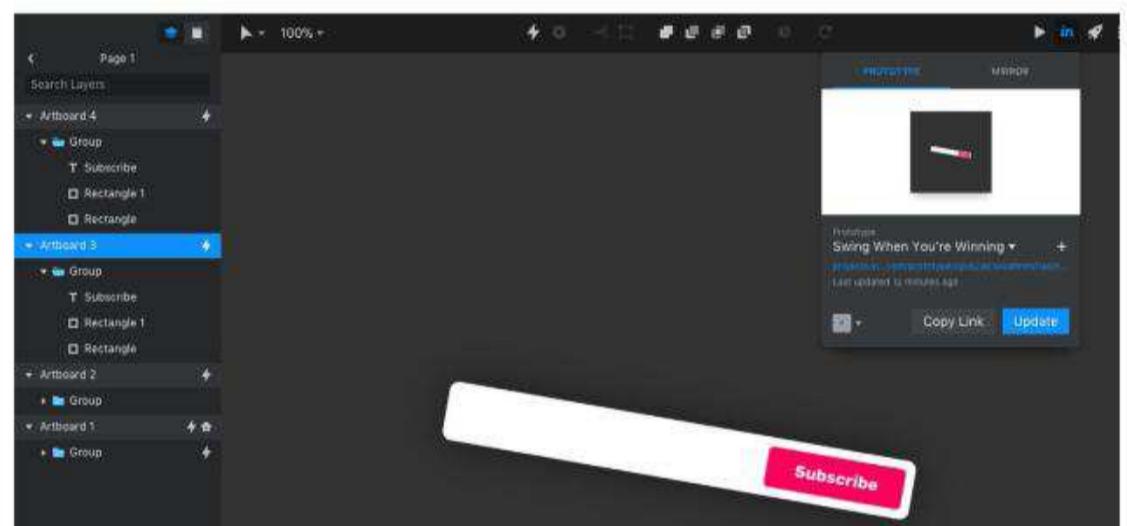
Hit the Play button to test and confirm. Here's the final animation: <https://projects.invisionapp.com/prototype/cjjx62ao100afmmo1ao1n4dwo/play>.

## EASING INTO EASINGS

Easings make animations appear more natural by slightly adjusting the speed of the animation at certain points. Here's a breakdown of each easing function supported by InVision Studio:

- Ease In: slower at the beginning
- Ease Out: slower at the end
- Ease Both: slower at the beginning and end
- Linear: maintains the same speed throughout

By default, Studio chooses the Ease Both option – this is why our animation feels somewhat smooth and natural already.



To change the easing of a specific layer or of the animation as a whole (easings are inherited) click the Easing icon.

## PUBLISH THE PROTOTYPE

Publishing our work to the core InVision web app means we have a sharable link that we can distribute and with this comes commenting features available to anybody (with the link). Click the Upload icon (you'll find it next to the Play icon), then click Publish after giving the prototype a name.

Publish the prototype to InVision to create a sharable link that anybody can comment on. Also note that in this window, we have access to design handoff tools, although Studio doesn't currently handoff animations. ■

**Top** Easings are a highly effective way of making animations feel more realistic

**Above** Publish the prototype to InVision to create a sharable link that anybody can comment on



## ABOUT THE AUTHOR

**MATT CROUCH**w: [www.mattcrouch.net](http://www.mattcrouch.net)

t: @mattcrouchuk

job: Software engineer at Vidsy

**areas of expertise:**

React, CSS-in-JS and accessibility

The screenshot shows the Storybook interface. On the left, there's a sidebar with a 'STORYBOOK' tab and a 'Filter' dropdown. Below the filter are several component categories: 'Button', 'Card', 'Image Card', 'Title Card', 'Title', and 'Action'. The 'Action' category is currently selected. In the center, there's a large preview area showing a sunset over palm trees with the text 'Lorem ipsum' and a 'Read More' button. At the bottom of the preview area, there's a toolbar with tabs for 'ACTION LOGGER', 'BACKGROUNDS', 'KNOBS', and 'VIEWPORT'. Below the toolbar, there's a detailed configuration panel for the 'Action' component. It includes fields for 'Title' (set to 'Lorem ipsum'), 'Description' (set to 'Lorem ipsum dolor sit amet, consectetur adipiscing elit. Praesent finibus sem libero, sit amet scelerisque justo tempor ac. Maecenas pulvinar in ante eu porta. Maecenas ac malesuada arcu...'), 'Button Text' (set to 'Read More'), 'Image URL' (set to '/image.jpg'), and an 'Invert' checkbox which is checked. A 'RESET' button is located at the bottom right of the configuration panel.

\* STORYBOOK

# DEVELOP REUSABLE REACT COMPONENTS

**Matt Crouch** shows how using Storybook as part of a development workflow can help create and exhibit resilient UI components

> When starting a fresh project, it can be easy to slip into some bad habits. As applications grow, components can start swelling in size and when the time comes to reuse a section of it, it can be hard to break apart. Large components become awkward to test, difficult to extend and easy to break.

The best way to avoid this problem is to split the UI into smaller, generic pieces that are easier to reuse because they get their data as props – a pattern known as ‘presentational components’. By focusing on the quality of smaller components like a button or input field, we know anything that would use those components will work as well.

Storybook is an environment to help develop these reusable components. By creating them in isolation, we can be sure they have no external dependencies that we haven’t explicitly defined. The result is an interactive style guide for an application, which can

be helpful not only to developers but to designers and testers also.

Storybook applications can be exported separately and run independently of the main application without the need of a development environment. As the result is just HTML, CSS and JS, they can be hosted on a service like GitHub Pages and live alongside the repositories that use them. Anyone in the company can load up the site and check it out.

## ADD STORYBOOK

To get started, we first need a React project ready to go. This can be any project but we can use `create-react-app` to generate one in a couple of lines. Open up the command line and run the following:

```
npx create-react-app storybook-app
cd storybook-app
```

[View source](#)

files here!

All the files you need for this tutorial can be found at  
<https://github.com/MattCrouch/storybook-tutorial>

From there we can install the Storybook CLI. This will add the basic features of the environment to the application. By installing this globally, it can be used to add Storybook to any NPM project in the future.

`npx @storybook/cli getstorybook`

This command updates `storybook-app` and adds a couple of commands to the `package.json`. Run the first one, which starts a local Storybook server ready to develop. Once it's ready, run the following and head to `localhost:9009` in a browser.

`yarn run storybook`

Storybook provides an overview and an example component when it first gets installed. These can be adapted or removed entirely.

## GET SET UP

Storybook works through the concept of 'stories'. Each component being developed will have its own set of stories that outlines a few typical use cases. The component that comes with Storybook, for example, has one story for plain text and then another for emoji.

By default, these stories are saved in `stories` directory at the root of the project. While this technically works, it's nonetheless best to keep all files related to a component together alongside other related files like styles and tests. We can change where Storybook finds its stories by updating `config.js` in the `.storybook` directory.

```
import { configure } from "@storybook/react";
const req = require.context("../src/components", true,
  /\.stories\.js$/);
function loadStories() {
  req.keys().forEach(filename => req(filename));
}
configure(loadStories, module);
```

Once Storybook is restarted, it will now look for any files ending in `.stories.js` anywhere inside a `components` directory.

## CREATE A COMPONENT

Our first component will be a button. As this will be a styled `<button>` element, we get a lot of its default behaviour for free.

The key to a reusable UI component is that it gets all of its data from props. No application behaviour should be assumed unless explicitly defined through those props.

# IN-DEPTH PRESENTATIONAL COMPONENTS

 Storybook encourages the development of reusable UI components by creating presentational components. But what exactly are they?

When creating interfaces, it's a good idea to split components into two pieces – a "container" side and a "presentational" side.

Container components deal with how the data comes to be. They are responsible for things like making requests to a server, fetching data from a store like Redux and creating callbacks to manipulate data from within the interface. These will never have any styles applied and will typically only render other components.

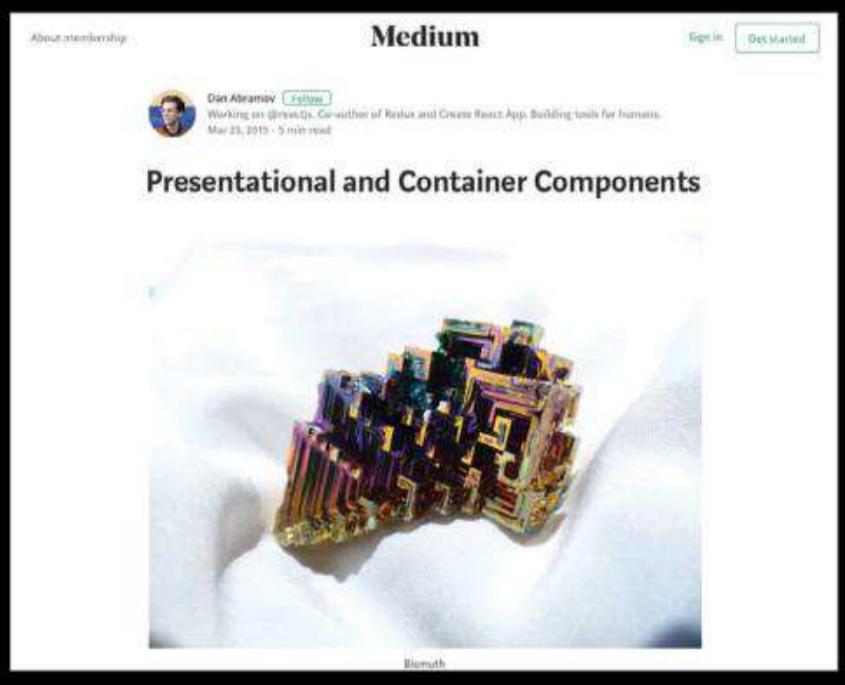
Presentational components take all the data from container components as props and display them as needed. They are unaware of how that data comes to be or how to update it. If anything does need to change, they will use the callbacks passed from the container.

This pattern makes sure the UI remains future-proof. If the data structure changes, the presentational components can stay untouched. As long as they still receive the same props as before, they will continue to work.

This approach makes components much easier to test in isolation. For example, unit tests can run quickly without having to request fresh data each time. The end result becomes predictable and repeatable.

Storybook uses this to its advantage. By only enabling components to be updated through props, developers can be sure they are being displayed correctly in all circumstances.

You can read more about presentational components from Dan Abramov at [https://medium.com/@dan\\_abramov/7ca2f9a7c7d0](https://medium.com/@dan_abramov/7ca2f9a7c7d0)



A screenshot of a Medium article by Dan Abramov. The article is titled "Presentational and Container Components". It features a photo of a colorful, crystalline mineral. The author's bio includes "Working on react.js, Co-author of Redux and Create React App, Building tools for Facebook". The article was published on May 23, 2015, and has a reading time of 5 minutes.

# IN ACTION

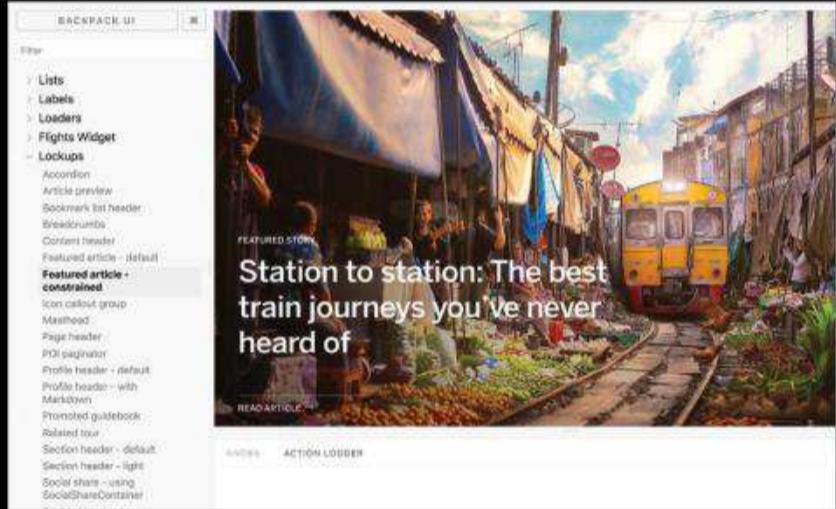
# STORYBOOK EXAMPLES

**+** Many companies are already using Storybook to help maintain their style guides. While some are used to help designers plan new features, others are geared towards enabling developers to use their existing components the right way. Here are three of the best.

## Carbon Components

[react.carbondesignsystem.com](https://react.carbondesignsystem.com)

IBM's Carbon design system was created to provide a unified feel for its cloud platform. It describes not only the components to create the interface but also the reasoning behind it. The React port of the system uses Storybook to demonstrate the look and feel of each component alongside the JSX needed to replicate it.



## Backpack UI

[lonelyplanet.github.io/backpack-ui](https://lonelyplanet.github.io/backpack-ui)

Lonely Planet is a travel site with offices around the globe. The challenge comes in trying to ensure all those developers use the right tools in the right way. The result is Backpack UI – a sleek collection of common React components. This approach to Storybook sets up common scenarios for each component but enables the user to tweak props to see their effects.

## React-Vis

[uber.github.io/react-vis](https://uber.github.io/react-vis)

Companies like Uber collect millions of data points each day. It required a solution to make sense of all this data, which could be reused across projects with ease. In 2016 it released the React-Vis library to help developers make new tools. This Storybook application enables customisation of colours and axes, which can then be copied through as JSX.

- ▶ Create a new Button directory under components and then create an index.js file that will hold the button. Create styles.css and add some styling there also, including when the type prop is set to "primary" or "danger".

```
import React from "react";
import "./styles.css";
const Button = ({ children, onClick, type }) => {
  const classes = ["Button"];
  if (type === "primary") {
    classes.push("Button--primary");
  } else if (type === "danger") {
    classes.push("Button--danger");
  }
  return (
    <button className={classes.join(" ")} onClick={onClick}>
      {children}
    </button>
  );
}
export default Button;
```

## CREATE A STORY

With the component set up, we can now import it into Storybook by creating its own story.

Each set of stories start by calling storiesOf, which will group all stories after it together. The first argument is the label of that grouping.

Each story is created by calling the add method from there. The first argument labels the story, while the second is a component to render. While we could render <Button/> directly, it means we can't change any of its props later on.

Create a Button.stories.js and create a story to render the button.

```
import React from "react";
import { storiesOf } from "@storybook/react";
import Button from ".";
storiesOf("Button", module).add("Basic Usage", () => {
  return <Button>Button Text</Button>;
});
```

When you are creating reusable components, it works best to have styles such as fonts inherited from the parent. As these aren't set yet, we get a fallback font.

## ADD GLOBAL STYLING

Some components may rely on inherited styles from higher up the tree. While it would be impractical to include them in every story, Storybook provides a way to inject content into the <head> of an iframe that the components are rendered in.

Create a new file in the `.storybook` directory called `preview-head.js` use it to import a font and apply it to the contents of the iframe. Restart Storybook for this to take effect.

```
<link href="https://fonts.googleapis.com/
css?family=Roboto+Condensed" rel="stylesheet">
<style type="text/css">
html {
  font-family: "Roboto Condensed", Arial, Helvetica, sans-
serif;
}
</style>
```

## CONTROL PROPS WITH KNOBS

While stories themselves are great for setting up typical scenarios, often we would want to see what happens with a specific combination of props. As the number of props grow, so do the different combinations possible. Instead of trying to cover each scenario with its own story, we can use on-screen controls called ‘knobs’ to adjust the props in real time.

Knobs are an example of an ‘add-on’ – plugins available for Storybook that enhance the core experience. Each add-on is installed and imported separately. To use knobs, we first need to fetch them from NPM.

```
yarn add @storybook/addon-knobs
```

Once installed, we need to let Storybook know about them by adding them to `./storybook/addons.js`.

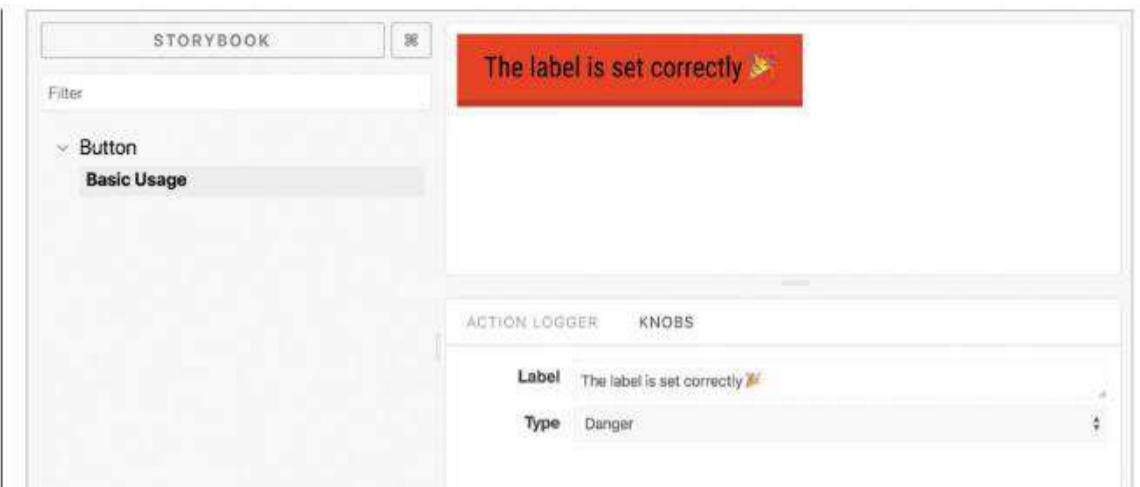
```
import "@storybook/addon-knobs/register";
```

To be used within a story we need to add them as a decorator. A decorator wraps the story in a special component that provides the behaviour. For knobs, all that’s needed is to import the decorator and add it just before creating a story.

```
import { withKnobs } from "@storybook/addon-knobs/react";
[...]
storiesOf("Button", module)
.addDecorator(withKnobs)
.add(...)
```

The knobs add-on comes with a set of common controls to alter the rendered props from the bottom of the screen.

The two we want are “text” to render a textbox for the button label and “selectV2” to provide options for the `type` prop. Both take a label and default value,



with “`selectV2`” taking an object of options as its second argument.

```
import { selectV2, text, withKnobs } from "@storybook/
addon-knobs/react";
const types = {
  Default: "default",
  Primary: "primary",
  Danger: "danger"
};

const buttonText = text("Label", "This is Net Magazine");
const type = selectV2("Type", types, Object.values(types)[0]);
return <Button type={type}>{buttonText}</Button>;
```

The components update with the content in real time. This can be useful to see exactly at what point a design starts to break.

## TRY OTHER ADD-ONS

There are plenty of add-ons available to help out on any project.

The “Actions” add-on provides a way to dummy out actions within a component. By passing in an action as an event prop, we could check to see our button’s `onClick` handler was behaving correctly.

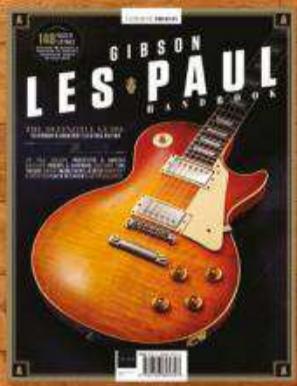
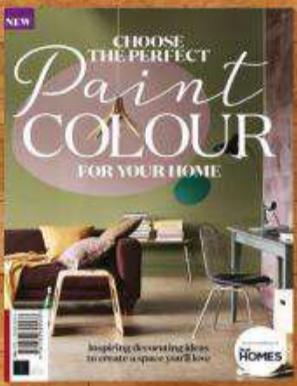
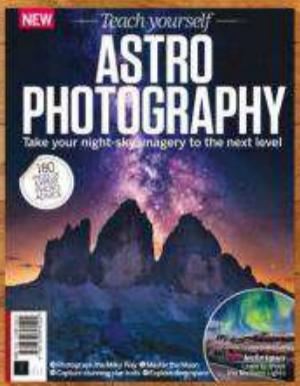
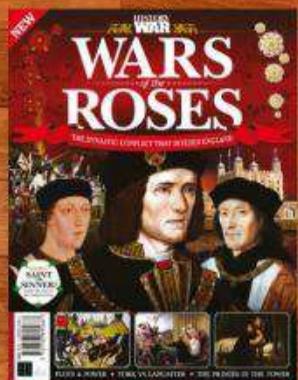
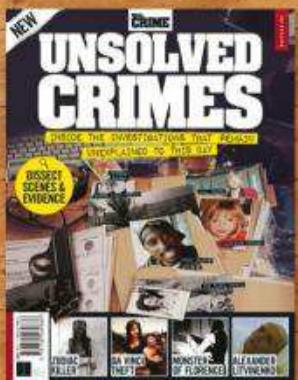
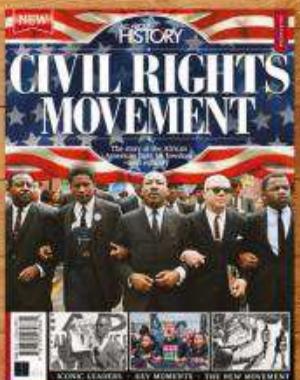
The “Storyshots” add-on can help create Jest snapshots from stories. When each test runs, it renders each story and compares it to the last time it ran. Any differences are flagged for investigation.

The “Viewports” add-on provides a pre-defined list of common viewports to check how the components behave. This helps avoid having to try and resize the window without including the Storybook sidebar.

Depending on the needs of the project, it is also possible to create custom add-ons for each Storybook project. These can be useful for common setup such as state management systems or localisation strings.

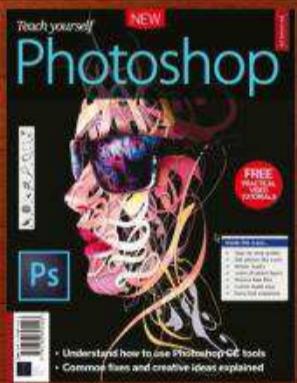
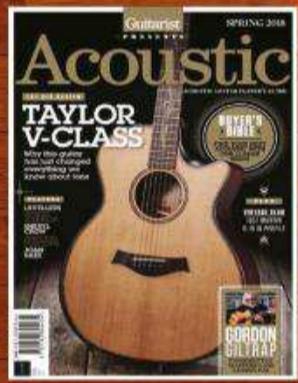
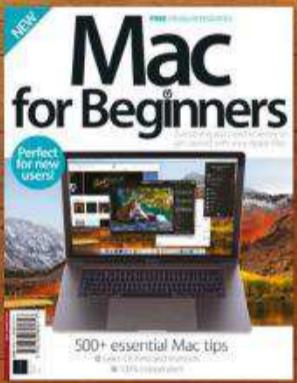
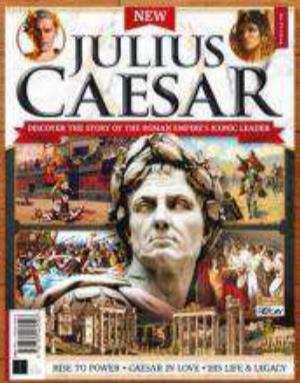
See a full list of add-ons provided by Storybook at <https://storybook.js.org addons/addon-gallery>.

**Above** Utilise knobs to adjust props in real time and avoid having to create stories to cover all possible prop combinations



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\* ACCESSIBILITY

# AVOIDING THE REACT ACCESSIBILITY TRAP

**Benjamin Read** challenges the perception that React supports inaccessible coding

Recently I've heard React being criticised for not being accessible. I have to disagree. Just like any other front-end code, working with React in an accessible way requires some forethought.

One of the common mistakes I've seen is putting click events on non-semantic elements. React makes it easy to put a click event on any dom element. A reason for this is that, with React, our JavaScript is our single source of truth, so we tend to think in JavaScript.

However, when thinking about accessibility, we're committing ourselves before we start coding that we're going to do things the right way, including using semantic elements. If we do this, we'll ensure we assign a click event to a semantic element to start with a `<button>` or an `<a>` tag or we'll do all the extra legwork that's required to make up for it.

## ACCESSIBILITY IN COMPONENTS

Another way to encourage others using your components to think in an accessible way is to include accessibility features in your components. For example, this component passes down a prop that's an image source: `<img src={this.prop.imgur}>`.

The `alt` attribute is missing. How do we encourage accessibility in this instance? Wrap the component in a conditional, so it doesn't render without the `alt` tag:

```
{ this.props.imgalt ? <img src={this.prop.imgur} alt={ this.props.imgalt }/> : null }
```

You could go a bit further with this and check that the length of `imgalt` is greater than 0.

## ACCESSIBILITY AT ALL STAGES

Just as our thinking process starts with the commitment to code with accessibility in mind, our launched product should finish with accessibility. Did you really build an accessible site or app? Use software to test what you can and take your product to friends and relatives or your audience. How do they get on using it?

React has plenty of built-in support for building things in an accessible way – check out the documentation (<https://reactjs.org/docs/accessibility.html>). The question is will you make that commitment to yourself and the people who will use your site? ■

**PROFILE**  
Benjamin is a web designer and developer specialising in JavaScript, React and UX.  
Follow him @muzzlehatch\_

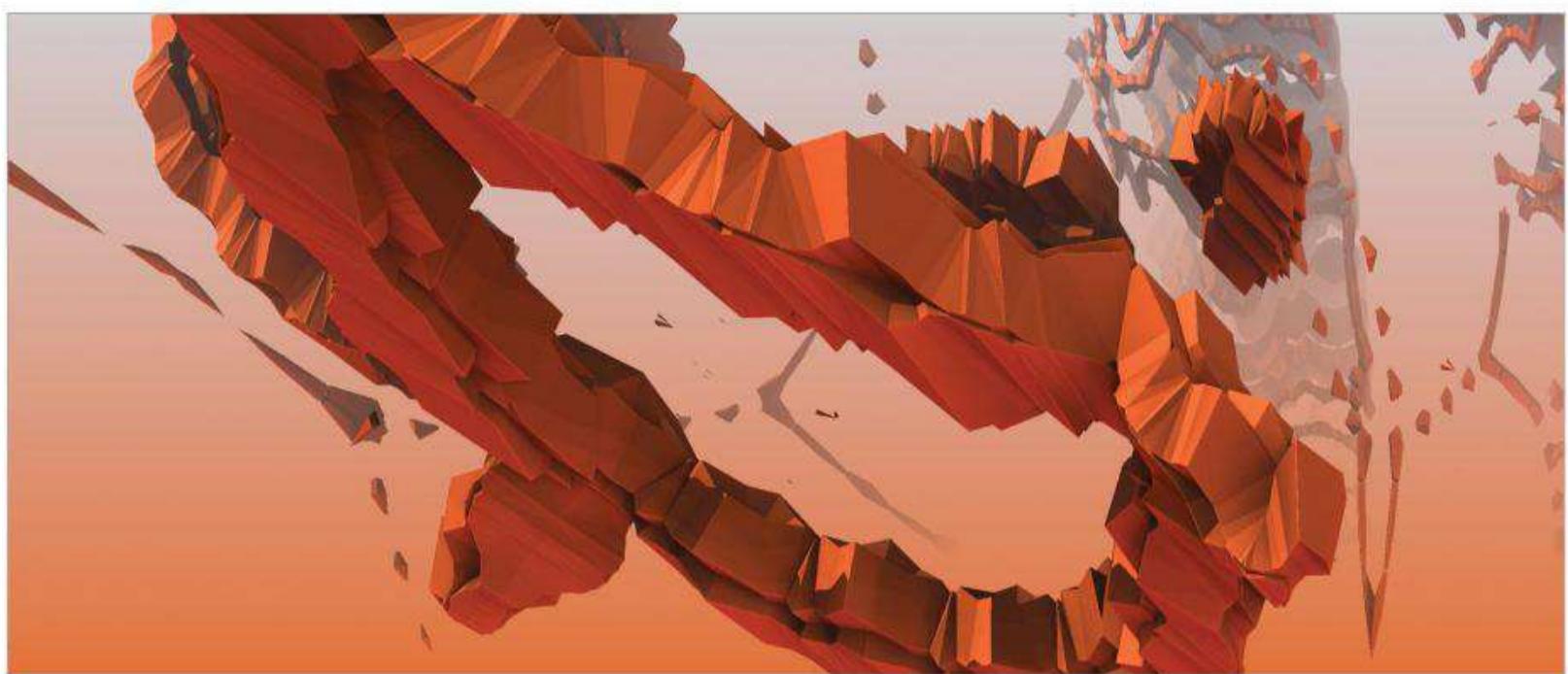




## ABOUT THE AUTHOR

**RICHARD MATTKA**w: <http://richardmattka.com>

t: @synergyseeker

job: Interactive director,  
designer, developerareas of expertise:  
Shaders, VFX, WebGL

## \* THREE.JS

# GET STARTED WITH SHADERS IN THREE.JS

Richard Mattka continues exploring shader programming, using shaders as materials for objects in WebGL 3D libraries such as three.js

 Shaders enable a wide range of effects by working directly with the graphics hardware of devices. This tutorial continues our series by showing you how to map UVs of 3D objects to your shader, so that the shader materials move with the geometry of your 3D objects. You'll gain some cool effects and practical visuals you can use right away in your projects.

## SET UP A BASIC HTML PAGE

Start by setting up the HTML page and some basic CSS to size things for full screen. This tutorial will use three.js to handle drawing to the canvas so you will need to add a reference to the three.js library, which you can grab here: <https://github.com/mrdoob/three.js>

```
<!DOCTYPE html>
<html lang="en">
<head>
  <script src="three.min.js"></script>
  <style>
    html, body { margin: 0; padding: 0; }
```

```
  canvas { width: 100%; height: 100% }
</style>
</head>
<body>
  <script>
    // main code here
  </script>
</body>
</html>
```

## VERTEX AND FRAGMENT SHADERS

You can load shaders in a few different ways. Best practice would be to separate these shaders into their own files and load them as needed via JavaScript. You'll learn how to do that in the next tutorial but for now use this approach to get started. This inline technique is great for quick and simple prototypes and swift tests. Simply add this code in the `<head>` of your HTML.

```
<script id="vertexShader" type="x-shader/x-vertex">
</script>
<script id="fragmentShader" type="x-shader/x-
```

```
fragment">
</script>
```

## CREATE A VERTEX SHADER

Shadertoy shaders are concerned with the fragment shader portion of the pipeline, which is what you just created. In three.js you can also work on the vertex shader. To do this, add a simple vertex shader to the code between the vertex shader script tags. This will pass the position data to the fragment shader:

```
varying vec2 vUv;
void main() {
    vUv = uv;
    vec4 mvPosition = modelViewMatrix *
vec4(position, 1.0 );
    gl_Position = projectionMatrix * mvPosition;
}
```

## MAKE A FRAGMENT SHADER

Next, copy and paste your favourite shader into the fragment shader section of your HTML. You can use the one provided here or your own.

There are a few things to adjust when migrating code from external sources. First, be sure references to `FragCoord` are updated to `gl_FragCoord` and `FragColor` to `gl_FragColor` to match up to three.js' internal references. If you use functions for loading textures such as `texture` it needs to use `texture2D`.

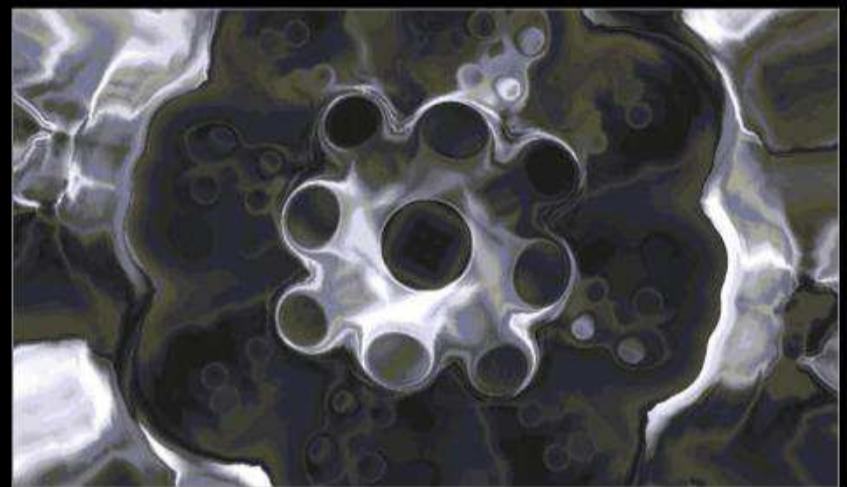
Some code may use variables (uniforms) such as `iGlobalTime` instead of `iTime` or `resolution` instead of `iResolution`. Ensure these are consistent in your shader code and the uniforms you'll set up later. Last, be sure to update the `mainImage` function declaration to use the simpler form `main` with no parameters.

Your fragment shader code between the shader's script tags should look like this now, if you want to use our sample one:

```
uniform float iTime;
uniform vec2 iResolution;
void main(){
    vec2 uv = gl_FragCoord.xy/iResolution.xy; //
normalize
    vec2 p = (2. * uv - 1.); // center
    float d=.01; // intensity
    vec3 col; // color
    float l = length(p);
    float t = iTime*.25; // adjust speed
    for(int i=0;i<=3;i++) {
        uv+=p/l*(cos(l - t));
        col[i]=d/length(mod(uv,1.0)-.5);
    }
    gl_FragColor=vec4(col/l,0.);
```

★ SHADERS

# WHAT ARE GRAPHIC SHADERS?



Shaders can be used to create beautiful generative effects optimised for performance.



If you missed previous articles or are new to graphic shaders, here is the quick primer.

Multiple shaders work together in the graphics pipeline. Some are programmable, some are locked to the hardware. We're most interested in two shaders in the pipeline – vertex shaders and fragment shaders. These are the core of the OpenGL Shading Language and the WebGL graphics pipeline. We're going to focus largely on fragment shaders in these tutorials.

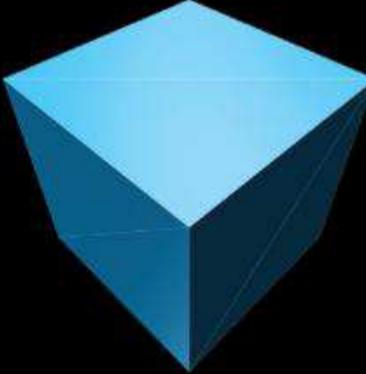
GLSL (OpenGL Shading Language) shaders compile and run on a wide range of platforms. You can apply what you learn to any environment that uses OpenGL, OpenGL ES or WebGL. This means you can use this knowledge for websites, three.js, iOS games, interactive installations, Unity, openFrameworks, Processing and many others.

### What is a fragment shader?

This shader, which is typically the last in the pipeline, instructs each fragment or pixel what colour it should be. It does this by setting a value for `fragColor` in the code's "main" function. It's where we'll create our photo filters, animations, effects and so much more, by manipulating the colours of the pixels.

### What is a vertex shader?

Vertex shaders handle the processing of individual vertices. They take a vertex as an input and return one as an output in a 1:1 mapping. Because we won't be diving into manipulation of 2D or 3D primitives or geometry, we don't need to do anything with these to get started. Just know that it is the first step in the pipeline and for now is essentially giving us a canvas to colour.



## SYNTAX

# THREE.JS

## CORE ELEMENTS

Three.js is a powerful WebGL library for web apps and sites

**The scene**  
The scene is a container object that encapsulates the other objects and elements that we wish to show.

**Camera**  
Three.js has a few different camera classes, including a PerspectiveCamera, which we will use for 3D and an OrthographicCamera, used for rendering 2D scenes or UI elements.

**Renderer**  
The renderer handles the display of the 3D scene using WebGL. It targets an HTML <canvas> element to draw into. Typically you will call the renderer to render each frame.

**Materials**  
Three.js comes with several materials, such as Normal, Basic, Lambert, Phong and Shader. Materials are used to texture the faces of an object's geometry. Attributes include things such as textures maps, colour and opacity.

**Geometry**  
Geometry defines the vertices of an object to draw it. Faces created by these vertices are also defined, which can be filled by a material. It can be defined manually through code or as predefined primitives such as planes or spheres. It can also be loaded from external files exported from 3D modelling software.

**Mesh**  
A mesh is the combination of a geometry and a material. This mesh object is what we would typically think of as a physical object because it now has enough information to be seen.

### ► SET UP A BASIC 3D SCENE

If you've been following this series, this will be familiar from the previous tutorial. You need to add your JavaScript code to create a basic 3D scene. You'll add global variables, create a scene, a camera and the renderer and add it to your web page. Add this code:

```
var camera, scene, renderer;
var uniforms, material, mesh;
var startTime = Date.now();
var clock = new THREE.Clock();
init();
function init() {
    //create a Three.js scene
    scene = new THREE.Scene();

    // add a camera
    camera = new THREE.PerspectiveCamera( 45,
    window.innerWidth / window.innerHeight, 1, 1000000 );
    camera.position.z = 1;

    // add the renderer
    renderer = new THREE.WebGLRenderer({antialias:true});
    renderer.setSize( window.innerWidth, window.innerHeight );
    document.body.appendChild( renderer.domElement );
}
```

**Note:** We moved the camera back a little using the position property so it would not occupy the same position as the plane we're rendering our shader on. If you ever find your 3D object is a bit too close, adjust that camera.position.z value.

### CUSTOM SHADER MATERIAL

You need to create a JSON object to hold uniform values that correspond to your fragment shader's uniforms. You've used iTime and iResolution in your shader but if you modified your shader code, be sure to include all the uniforms you wish to update. Declare the shader material and assign your uniforms a JSON object and the two shaders you created previously, like this.

```
// set up uniforms
uniforms = {
    iTime: { type: "f", value: 10000.0 },
    iResolution: { type: "v2", value: new THREE.Vector2() }
};

uniforms.iResolution.value.x = window.innerWidth;
uniforms.iResolution.value.y = window.innerHeight;
// create custom shader material
```

```
material = new THREE.ShaderMaterial( {
    uniforms: uniforms,
    vertexShader: document.getElementById(
    'vertexShader' ).textContent,
    fragmentShader: document.getElementById(
    'fragmentShader' ).textContent,
    side: THREE.DoubleSide
});
```

**Note:** We also defined the material to be double-sided, so as our object turns we can see it on the back side as well.

## 3D PLANE WITH THE SHADER MATERIAL

Next, create a 3D mesh by combining the built-in three.js PlaneGeometry and the new material you created. Then add it to the scene by incorporating this code inside your init function:

```
// create object mesh
var geometry = new THREE.PlaneBufferGeometry( 1, 1 );
var mesh = new THREE.Mesh( geometry, material );
scene.add(mesh);
```

You now have a 3D object mesh with a custom shader material. You're just about ready to see it in action.

## CREATE A RENDER ANIMATION LOOP

To see the scene rendered by the camera, you need to render a frame. You need to call and create your animation loop.

First, add the call to the animation function as the last line in your init function:

```
animate();
```

Then create a new function for animation outside the init function like this:

```
function animate() {
    requestAnimationFrame( animate );
    render();
}
```

## UPDATE SHADER UNIFORMS

For each frame, you need to increment the uniform's `iTime` by the amount of time that passed since the last frame. This enables the shader to animate over time. You will use the `clock` class that you declared previously to do this. Add this new function:

```
function render() {
    uniforms.iTime.value += clock.getDelta();
    renderer.render( scene, camera );
}
```

Now, when you run the code, you will see your shader on the plane.

Try adding this to your render code to rotate the mesh so we can see what we are doing:

```
// rotate mesh
mesh.rotation.y+=.01;
```

## MAPPING THE UVS

Dang! We have a problem. If you test your code now, you'd see the animation clipping, as if the plane was simply a mask for the shader. It's not mapped to the surface of the plane at all. To fix this, add this line to the top of your fragment shader, where you declare your uniforms. It will make the `vUv` being passed from the vertex shader accessible by your fragment shader code.

```
varying vec2 vUv;
```

Add this line to your fragment shader code right after declaring the `uv`, near the top. You use the vertex shader's `uv` now instead of the screen `uv`. This will map your fragment shader to the vertices of the 3D object.

```
uv = vUv; // instead use vertex uv
```

Now when you run your code, you'll see a shader material mapped perfectly to the plane!

## MAKE A CUBE

To make things more interesting and really see how this new shader material is mapping to the geometry of the object, try updating the object to use something more interesting like a cube. Replace your object declaring line with for the plane with this one:

```
var geometry = new THREE.BoxBufferGeometry( 1, 1 );
```

## TRY OUT DIFFERENT THINGS

You can experiment with shapes and shaders to find combinations that work. Simple planes make great backgrounds behind the main content. Objects like spheres, cubes, torus knots and custom models can be good for focal interactive objects. Multiple objects can be used together, all sharing the same shaders or using their own. Try swapping in this torus knot to see how it looks!

```
var geometry = new THREE.TorusKnotBufferGeometry(
    .7,.2 );
```

Next tutorial, we'll look at using vertex shaders to manipulate objects in 3D space! 



## ABOUT THE AUTHOR

### SIMON JONES

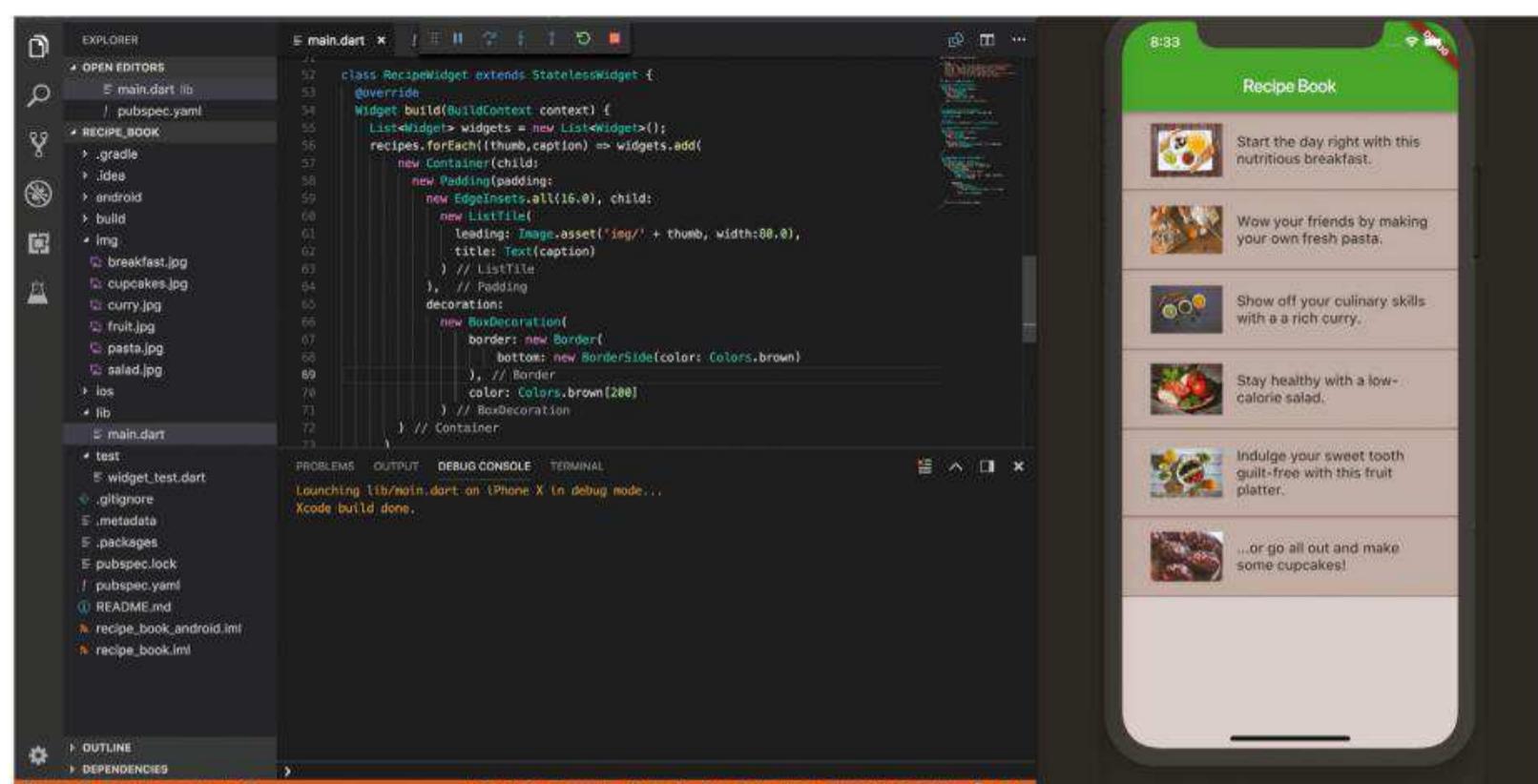
w: <http://simonjones.tech>

t: @j\_a\_nomis

job: Software engineering director

#### areas of expertise:

JavaScript, front-end frameworks, emerging technology



#### \* FLUTTER

# TAKE YOUR FIRST STEPS WITH FLUTTER

Take your first steps toward building cross-platform mobile apps with Google's new framework

 There have been numerous cross-platform mobile frameworks over the years, with steady improvements to developer experience and performance throughout. Flutter is a new addition to the pack and is particularly interesting because rather than using a JavaScript 'bridge' as many frameworks (such as React Native) do, it compiles to true native code.

In this tutorial, we'll look at how to set up Flutter and explore the basics of building apps using the framework, using macOS for our development. We'll assume that you've programmed before and know how to use the Bash shell but might not have developed for mobile.

You'll need to download and install a few things before you can make use of Flutter:

1. Xcode for iOS support
2. Android Studio for Android support

#### 3. Android SDK, which can be downloaded via Android Studio once you create a new project

Once you have all of these, run Xcode and Android Studio, install the additional components they offer and create a new project to make sure they run.

Now you're ready to get started with Flutter. Download the Flutter SDK from <https://flutter.io/>. Extract it to wherever you'd like it to be installed.

We need to update our path so macOS can find Flutter wherever you invoke it. Open (or create) \$HOME/.bash\_profile:

```
sudo atom $HOME/.bash_profile
```

Now add the flutter/bin directory to your \$PATH:

```
export PATH=/Users/simon/dev/flutter/bin:$PATH
```

Run a shell command to refresh the bash profile:

```
source $HOME/.bash_profile
```

Now we can start using the Flutter CLI. The first thing to do is make sure you have the latest version:

```
flutter upgrade
```

Once that is done, Flutter offers a handy diagnostic tool, which will check whether everything that you need is installed and set up correctly. It is really useful:

```
flutter doctor
```

Take note of what the doctor tells you and respond to any issues that arise. You might have to run the doctor a couple of times to gain additional feedback and act on it. Once it is happy with Flutter, Android Toolchain, iOS Toolchain and Android Studio, you are good to go. Don't worry about connected devices for now.

Xcode can require some extra steps at the shell to get it fully set up:

```
sudo xcode-select --switch /Applications/Xcode.app/Contents/Developer
brew install --HEAD libimobiledevice
brew install ideviceinstaller
brew install cocoapods
pod setup
```

And Android Studio often needs the license agreement accepting:

```
flutter doctor --android-licenses
```

Now that Flutter is set up, you'll want an IDE to work in. There are plugins available for Android Studio and IntelliJ. We're going to go with VS Code, which also has its own Flutter plugin.

Start up VS Code and click View>Command Palette. Type "install" and select the Extensions: Install Extension action. Search for "flutter" and install the Flutter plugin. Once done, restart VS Code.

We're now ready to begin developing. Start a new project through the Command Palette by selecting the Flutter: New Project option. Name your project, select where to save it and VS Code will invoke Flutter to generate the new project.

To test our project, we'll want a device simulator to allow us on the desktop. In the bottom right-hand corner of VS Code (in the blue bar), you'll see something saying No Devices. If you've developed



## APPROACHES TO MOBILE DEVELOPMENT

 MORE INFO

### Native

The default way of developing on mobile is to write native code for each device – usually Java for Android and Swift for iOS. This can give you the best result but the problem is that you then have two codebases to maintain.

### WebViews

The earliest way to get around this was to build 'hybrid' apps that were essentially web pages rendered within an app container (referred to as WebViews). The Ionic framework is an example of this approach. This has limitations in user experience and relies on a JavaScript 'bridge' to interact with native services, which can impact performance.

**React Native**

Build native mobile apps using JavaScript and React

[Get Started](#) [Learn the Basics](#)

**Build native mobile apps using JavaScript and React**

React Native lets you build mobile apps using only JavaScript. It uses the same design as React, letting you compose a rich mobile UI from declarative components.

```
import React, { Component } from 'react';
import { Text, View } from 'react-native';
```

### React Native

The release of React Native gave us the ability to write JavaScript code (with React syntax) that used entirely native widgets. It still uses a JavaScript runtime but the presentation is not HTML and it doesn't use a WebView. This takes away a major limitation of older hybrid apps but can still suffer performance issues due to reliance on the JavaScript 'bridge'.

### Flutter

While they offer similar reactive development styles, the major difference between Flutter and React Native is that Flutter dispenses with runtime JavaScript completely and compiles native code for multiple platforms. This offers superior start-up times and app performance.

### Progressive Web Apps

One possible future for mobile development moves away from the native environment completely. Web APIs now enable much more extensive interaction between web pages and devices than in the past and service workers mean pages can be cached and work offline. The technology isn't quite there yet but some people are betting that the future of mobile apps is actually web technology.

**RESOURCES**

# ONLINE RESOURCES FOR FLUTTER

**Xcode 10**

Xcode 10 includes everything you need to create amazing apps for all Apple platforms. Now Xcode and Instruments look great in the new Dark Mode on macOS Mojave. The source code editor lets you transform or refactor code more easily, see source control changes alongside the related line, and quickly get details on upstream code differences. You can build your own instruments with custom visualization and data analysis. Swift compiles software more quickly, helps you deliver faster apps, and generates even smaller binaries. Test suites complete many times faster, working with a team is simpler and more secure, and much more.



**Xcode**  
<https://developer.apple.com/xcode/>  
Xcode is Apple's mobile SDK and is required for iOS development with Flutter.

**Android Studio**  
<https://developer.android.com/studio/>  
This is Google's Android IDE and is required for Android development with Flutter. You can download the Android SDK using it.



**VS Code**  
<https://code.visualstudio.com>  
Microsoft's VS Code is arguably one of the best code editors out there and is a great IDE to use with Flutter.

**Dart**  
<https://www.dartlang.org/guides/language>  
The Dart programming language is core to Flutter but you probably won't have used it so it's worth taking time to get familiar with.

**Flutter Tutorials**  
<https://flutter.io/tutorials/>  
Flutter's own website has some great tutorials on how to build common app features.

► for mobile before, when you click this, you'll see your simulators available in the Command Palette.

If you have no simulators, run the following in the terminal to open the iOS simulator for the first time:

```
open -a simulator
```

You should then see an iOS simulator available when you restart VS Code.

Android is more complex. Load Android Studio and within an Android project, click Tools>Android>AVD Manager. Select Create Virtual Device.

Select the device to emulate – for example a Google Pixel 2. Click Next and you can also choose a system image (i.e. OS version) to download. On the next page under Emulated Performance, select Hardware – GLES 2.0 to enable hardware graphics acceleration on the emulator. Finish the process.

Once you've created the virtual device in Android Studio, restart VS Code and you'll see your Android emulator appear alongside the iOS simulator in VS Code's device list.

Now, if you click No Devices, you can select an iOS or Android device and a virtual phone will fire up on your desktop. Try it out with an iPhone X simulator.

Now the simulator is running, you can test out the starter app. Hit F5 or click Debug>Start Debugging. The app will load on the simulator and you can try interacting with it. Be patient if it doesn't happen immediately as it can take some time to build.

Before we can do the same on Android, we need to install gradle dependencies for our project (a small nuance of Flutter right now). Navigate to the project root directory and run:

```
android/gradlew
```

Then you can open an Android emulator and run the project in Debug mode as you did for iOS.

A great feature of Flutter is that it supports 'hot reloading' – that is, you can modify your source and see the changes reflected in the simulator right away. In main.dart, let's make a couple of changes to the MyApp class while the iPhone X simulator runs:

```
primarySwatch: Colors.green,  
home: new MyHomePage(title: 'Recipe Book'),=
```

You should see the changes take effect as soon as you save.

What we haven't yet talked about is the Dart programming language that Flutter uses. Dart is an object-oriented language with C-style syntax, developed by Google and all Flutter development uses it. If you've already got some experience of web

or mobile development then it shouldn't be totally alien to you.

Everything in Flutter is based on widgets, which are the building blocks of an app. If you've used React before, Flutter's approach is very similar and widgets are analogous to components. Essentially your entire app can be decomposed into a hierarchy of widgets.

This is easily seen within the `MyApp` class. `MyApp` is a `StatelessWidget` (this means it's immutable). The `build()` method we are overriding tells Flutter how the widget should be rendered. This is similar to React's `render()` function. The method returns a `MaterialApp` widget, which represents an app that uses Google's Material Design. This in turn has several properties, which are themselves widgets: `ThemeData` defines the visual style to be used and `MyHomePage` is a custom widget defined further down the `main.dart` file that contains the body of the app.

Unlike the stateless `MyApp`, `MyHomePage` is a stateful widget. This means its behaviour is defined by the `_MyHomePageState` class, enabling it to store information and change accordingly, such as when you press the button on the app. You can see it's currently using many built-in widgets Flutter provides to handle common things like layout, buttons and text display. Let's make some changes to that class to modify what our app presents.

```
class _MyHomePageState extends State<MyHomePage> {
  @override
  Widget build(BuildContext context) {
    return new Scaffold(
      appBar: new AppBar(
        title: new Text(widget.title),
      ),
      body: new Container(
        decoration: new BoxDecoration(color: Colors.
        brown[100]),
        child: new RecipeWidget()
      );
    }
}
```

We've disposed of the existing content and replaced it with a brown `Container` widget but we also need to create a custom widget, `RecipeWidget`, that will be put in the container.

```
class RecipeWidget extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    List<Widget> widgets = new List<Widget>();
    return new ListView(children: widgets);
  }
}
```

```
}
```

Next, let's load some assets with the app so we can add them to the `ListView` widget within `RecipeWidget`. Static assets for an app are specified in `pubspec.yaml` under the 'flutter' section:

```
assets:
  - img/breakfast.jpg
  - img/curry.jpg
  - img/pasta.jpg
```

We'll also create a simple data structure in `main.dart`, pairing images with strings to act as a thumbnail and summary for recipes.

```
var recipes = {
  'breakfast.jpg': 'Start the day right with this nutritious
  breakfast.',
  'pasta.jpg': 'Wow your friends by making your own fresh
  pasta.',
  'curry.jpg': 'Show off your culinary skills with a rich
  curry.',
};
```

Finally, let's update `RecipeWidget` to build a list of widgets displaying the recipes. We use `Image.asset` to load the static assets we included in `pubspec.yaml`.

```
recipes.forEach((thumb,caption) => widgets.add(
  new Container(child:
    new Padding(padding:
      new EdgeInsets.all(16.0), child:
      new ListTile(
        leading: Image.asset('img/' + thumb, width:80.0),
        title: Text(caption)
      )
    ),
    decoration:
      new BoxDecoration(
        border: new Border(
          bottom: new BorderSide(color: Colors.brown)
        ),
        color: Colors.brown[200]
      )
  )
);
```

Hopefully you're starting to get a feel for how Flutter uses widgets to construct apps. Try using the simulator to rotate the device. The Flutter layout automatically accommodates the changes. For comparison, try the app on the Android emulator. 

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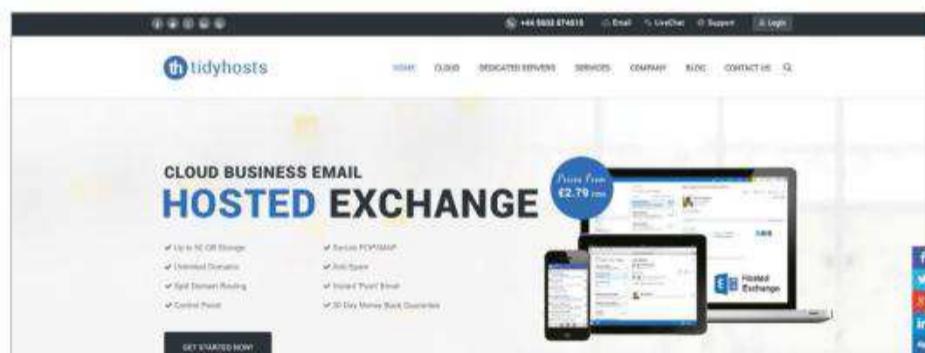
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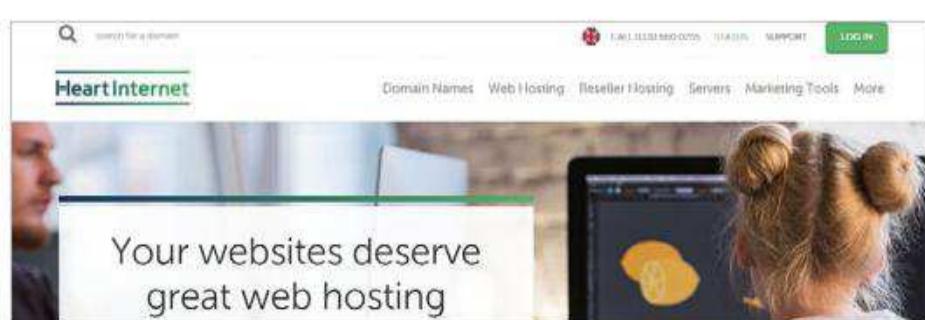
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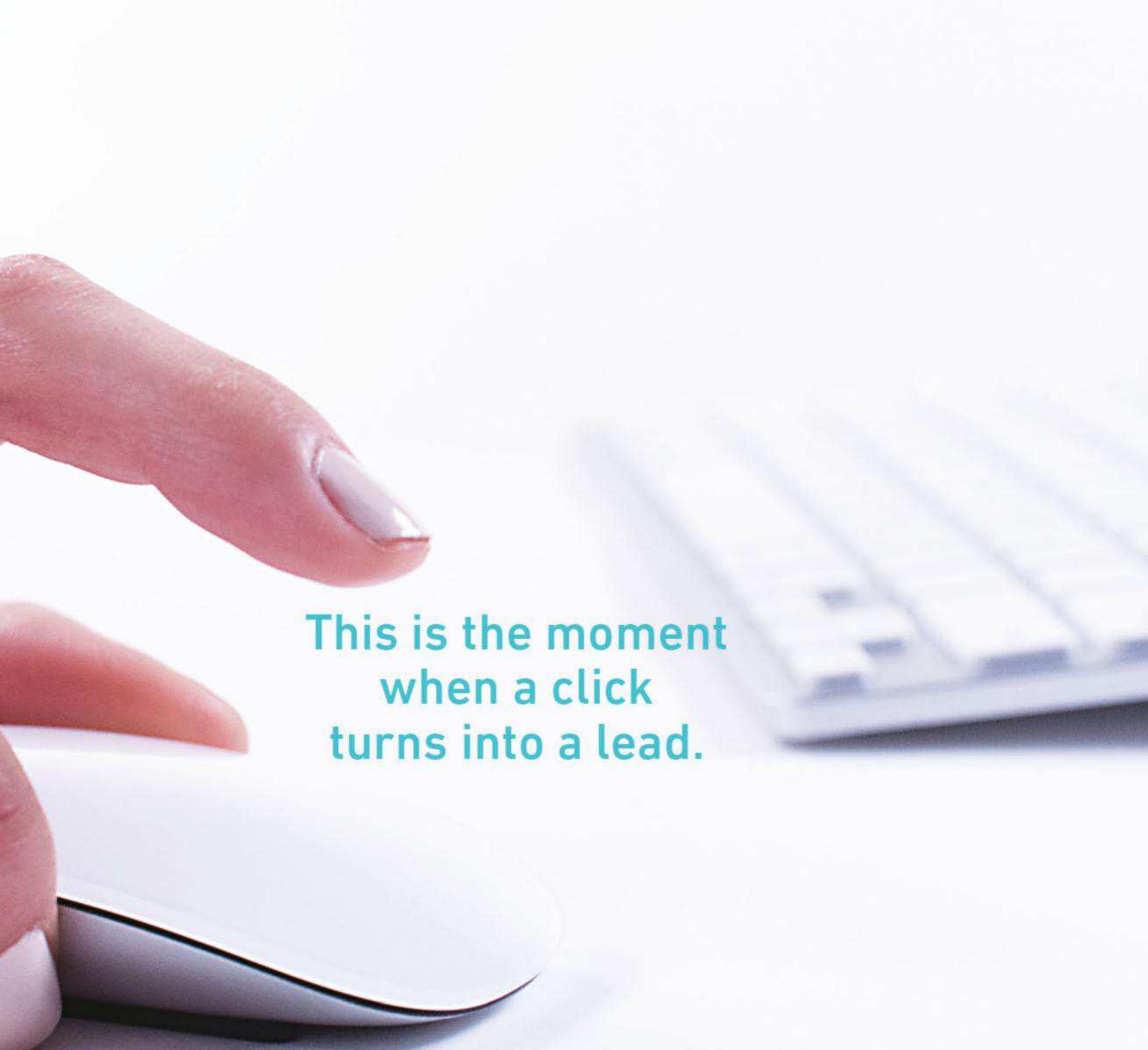
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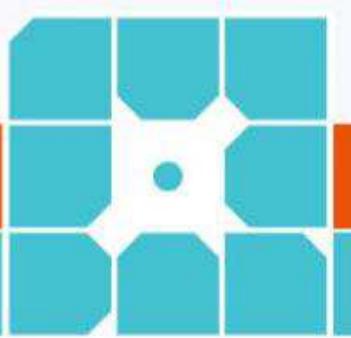
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