

# 19tris. Design patterns

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Interazione Uomo Macchina  
Prof. Maurizio Mancini



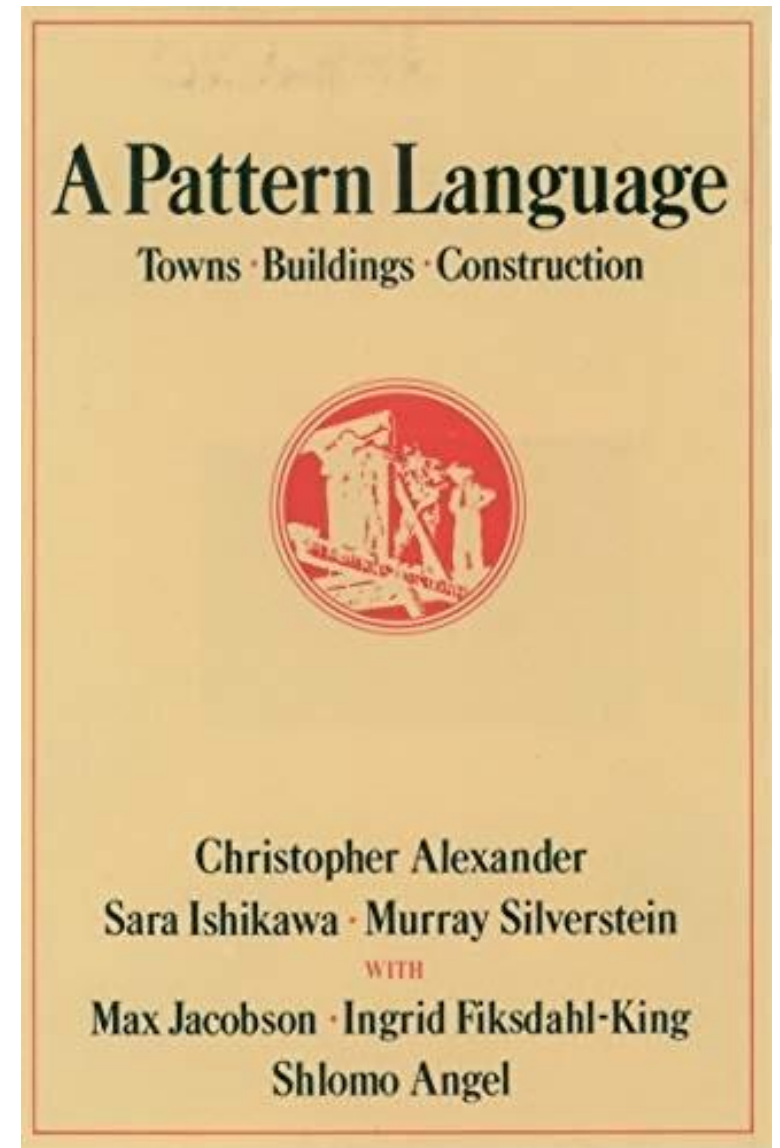
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DI INFORMATICA  
**SAPIENZA**  
UNIVERSITÀ DI ROMA

**Human Computer Interaction**  
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# Design Patterns

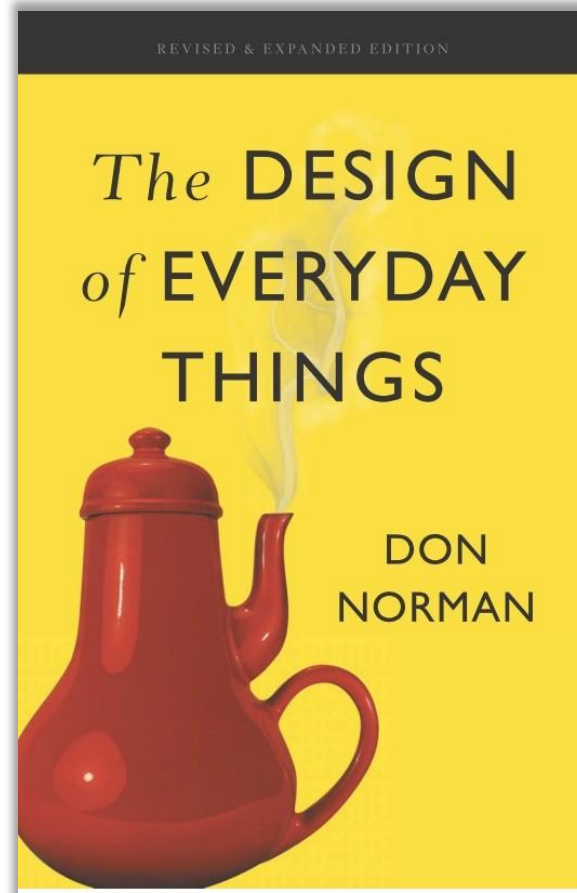
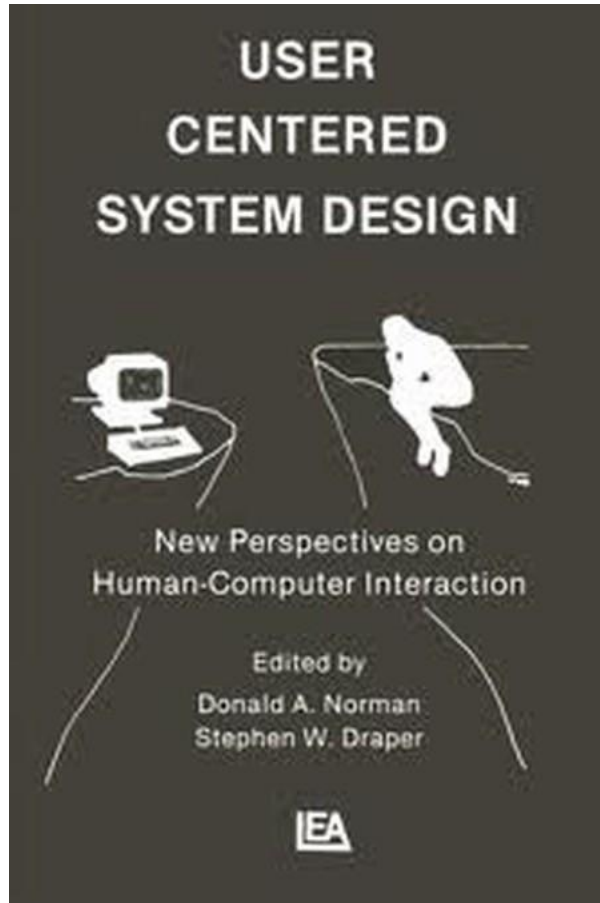
- Design patterns were first used in architecture
- The idea was introduced by the architect Christopher Alexander, who defined a design pattern in this way: *"Each pattern describes a problem that occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice."*



# Design Patterns

- They are a way to communicate common **design problems** and **related solutions**
  - Design patterns are recurring solutions that solve common design problems
- They not too general and not too specific
  - use a solution “a million times over, without ever doing it the same way twice”
- They are a *shared language*
  - Design patterns are standard reference points for designers
  - They allow for debate over alternatives, where merely mentioning the name of a design pattern implicitly carries much more meaning than merely the name
  - They are readable by non-experts

# Patterns in HCI



# UI Design Patterns

- Each user interface is unique and has its own set of goals and data, but...
  - This does not mean that we should force users to learn new conventions to operate them!
- With UI design patterns, we can accelerate our users understanding of the interface

# UI Design Patterns

## Design patterns

User Interface Design patterns are recurring solutions that solve common design problems. Design patterns are standard reference points for the experienced user interface designer.

Dwell into the patterns below to learn a common language of web design.

Design patterns provide a common language between designers. They allow for debate over alternatives, where merely mentioning the name of a design pattern implicitly carries much more meaning than merely the name.

### User Interface Design Patterns

Getting input	Navigation	Dealing with data	Social
<b>Forms</b> <ul style="list-style-type: none"><li>Password Strength Meter</li><li>Structured Format</li><li>Captcha</li><li>Rule Builder</li><li>Keyboard Shortcuts</li><li>Drag and drop</li><li>Inplace Editor</li><li>Preview</li><li>Expandable Input</li><li>Autosave</li><li>Input Prompt</li><li>Good Defaults</li><li>Fill in the Blanks</li><li>WYSIWYG</li><li>Input Feedback</li></ul>	<b>Tabs</b> <ul style="list-style-type: none"><li>Navigation Tabs</li><li>Module Tabs</li></ul> <b>Jumping in hierarchy</b> <ul style="list-style-type: none"><li>Breadcrumbs</li><li>Fat Footer</li><li>Notifications</li><li>Modal</li><li>Home Link</li><li>Shortcut Dropdown</li></ul> <b>Menus</b> <ul style="list-style-type: none"><li>Vertical Dropdown Menu</li><li>Accordion Menu</li><li>Horizontal Dropdown Menu</li></ul> <b>Content</b>	<b>Tables</b> <ul style="list-style-type: none"><li>Alternating Row Colors</li><li>Sort By Column</li><li>Table Filter</li></ul> <b>Formatting data</b> <ul style="list-style-type: none"><li>Frequently Asked Questions (FAQ)</li><li>Dashboard</li><li>Copy Box</li></ul> <b>Images</b> <ul style="list-style-type: none"><li>Gallery</li><li>Slideshow</li><li>Image Zoom</li></ul> <b>Search</b> <ul style="list-style-type: none"><li>Autocomplete</li><li>Search Filters</li></ul>	<b>Reputation</b> <ul style="list-style-type: none"><li>Collectible Achievements</li><li>Testimonials</li><li>Leaderboard</li></ul> <b>Social interactions</b> <ul style="list-style-type: none"><li>Activity Stream</li><li>Auto-sharing <small>Mini</small></li><li>Friend list <small>Mini</small></li><li>Reaction</li><li>Chat</li><li>Follow</li><li>Invite friends</li><li>Friend</li></ul>
			Miscellaneous

<https://ui-patterns.com/patterns>

# UI Design Patterns

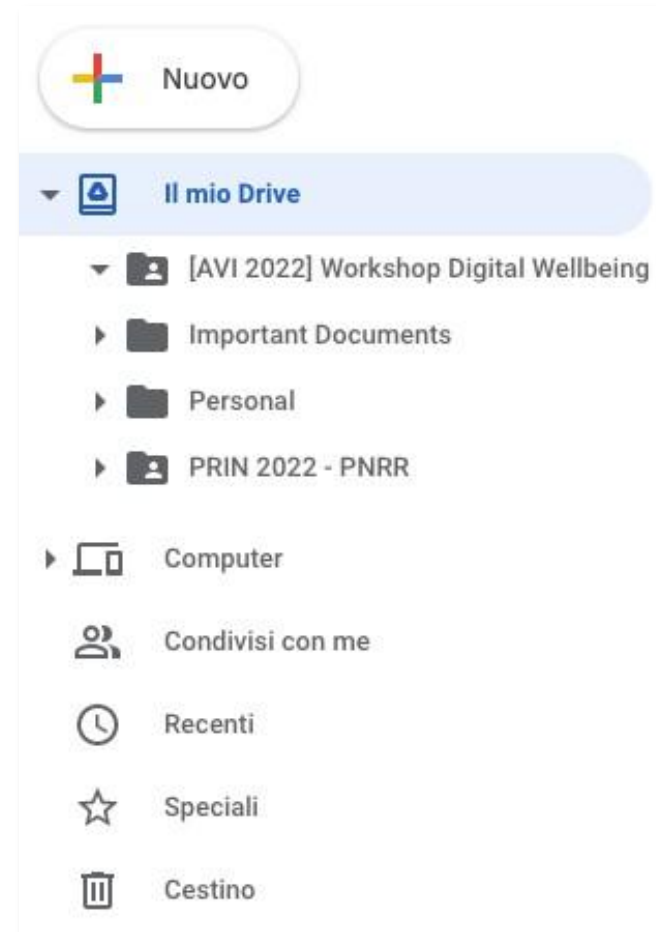
## ACCORDION MENU

DROPDOWN MENU

CARDS

BREADCRUMBS

THE HAMBURGER



# UI Design Patterns

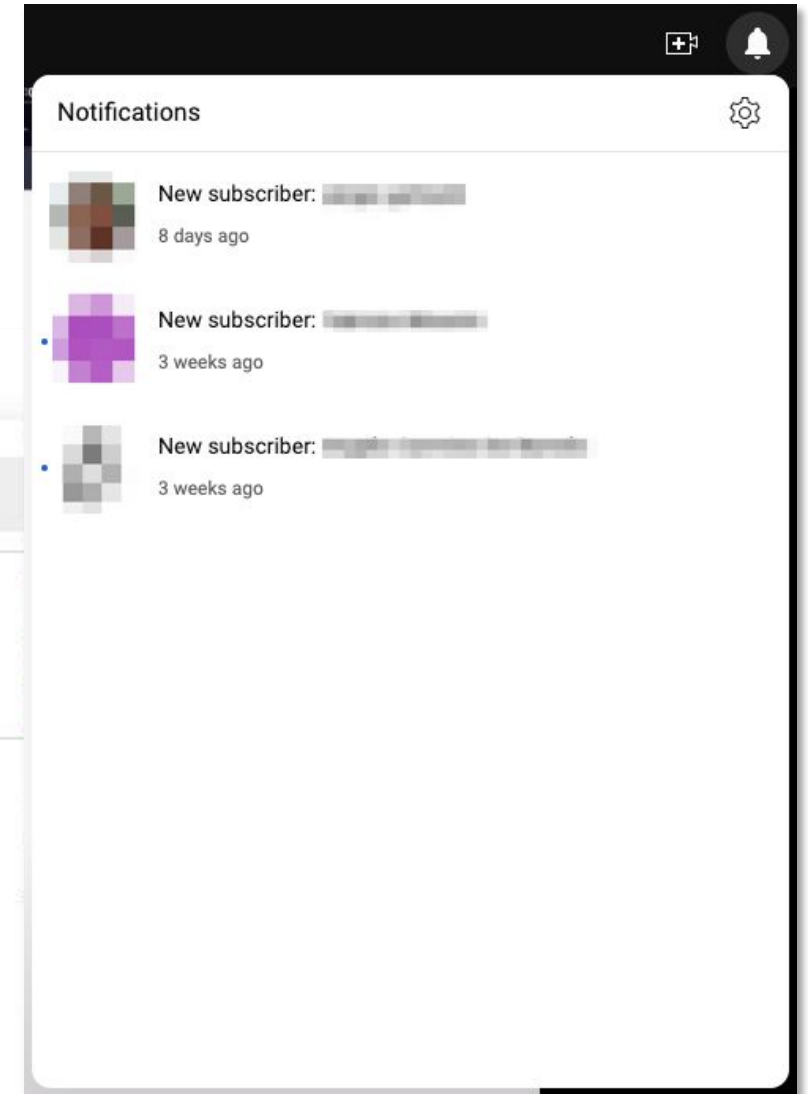
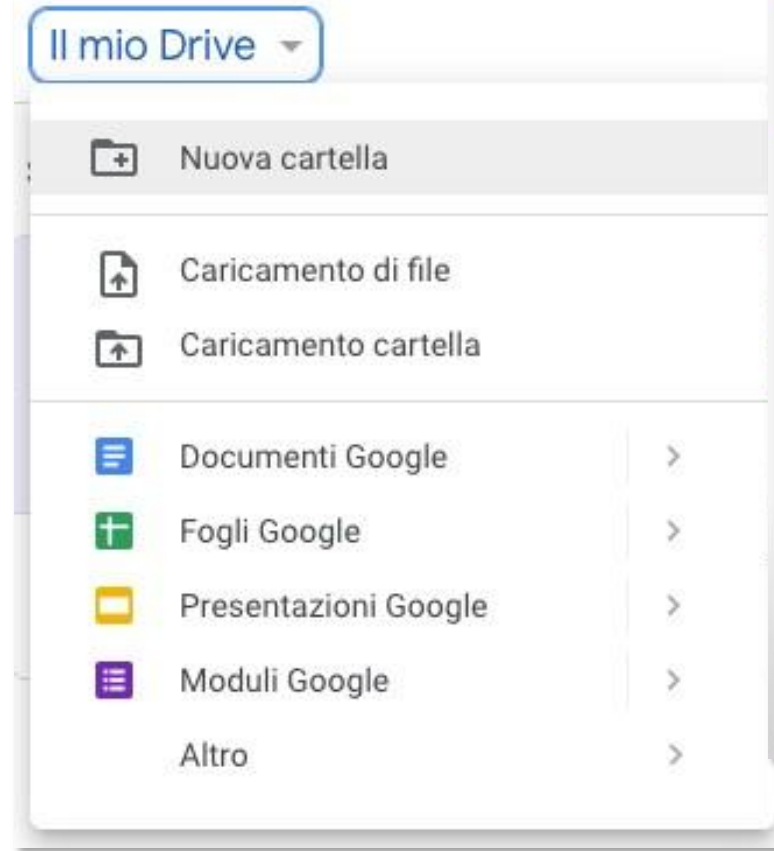
ACCORDION MENU

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# UI Design Patterns

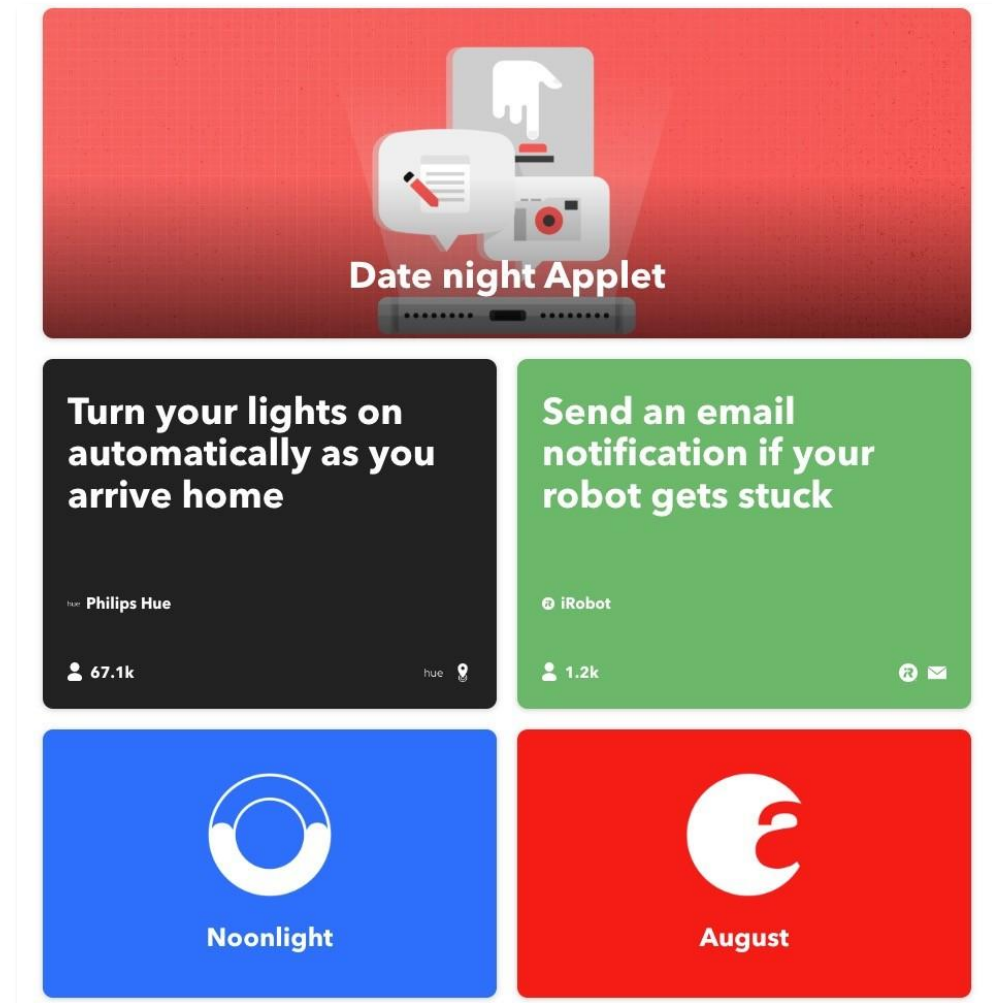
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# UI Design Patterns

ACCORDION MENU

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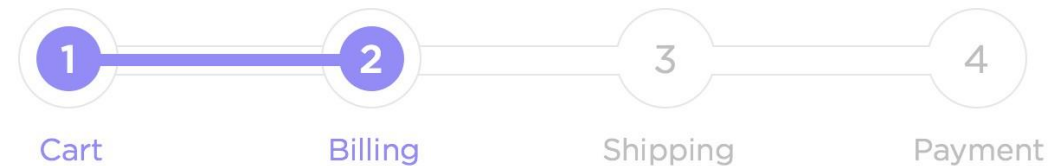
**BREADCRUMBS**

THE HAMBURGER

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# UI Design Patterns

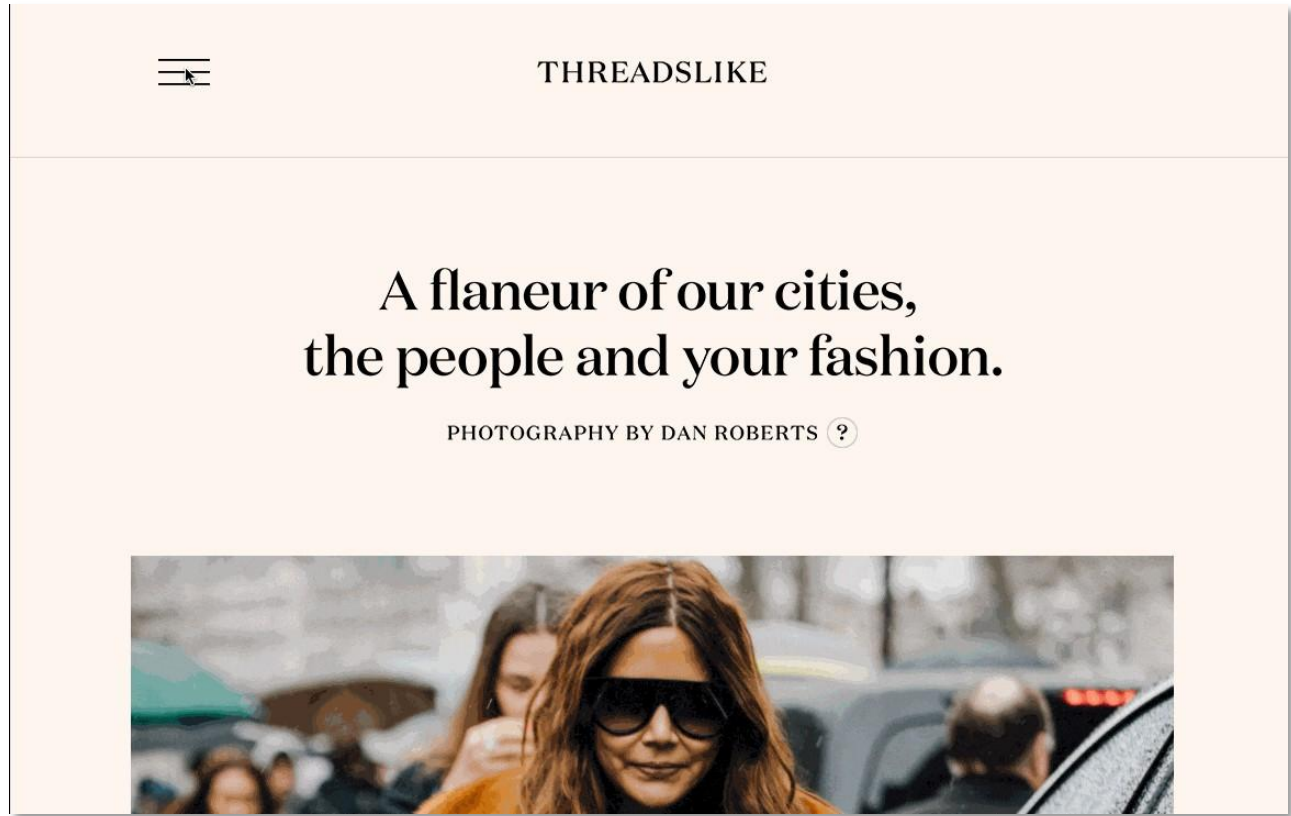
ACCORDION MENU

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BREADCRUMBS

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# Design Patterns in (Android) Mobile Apps

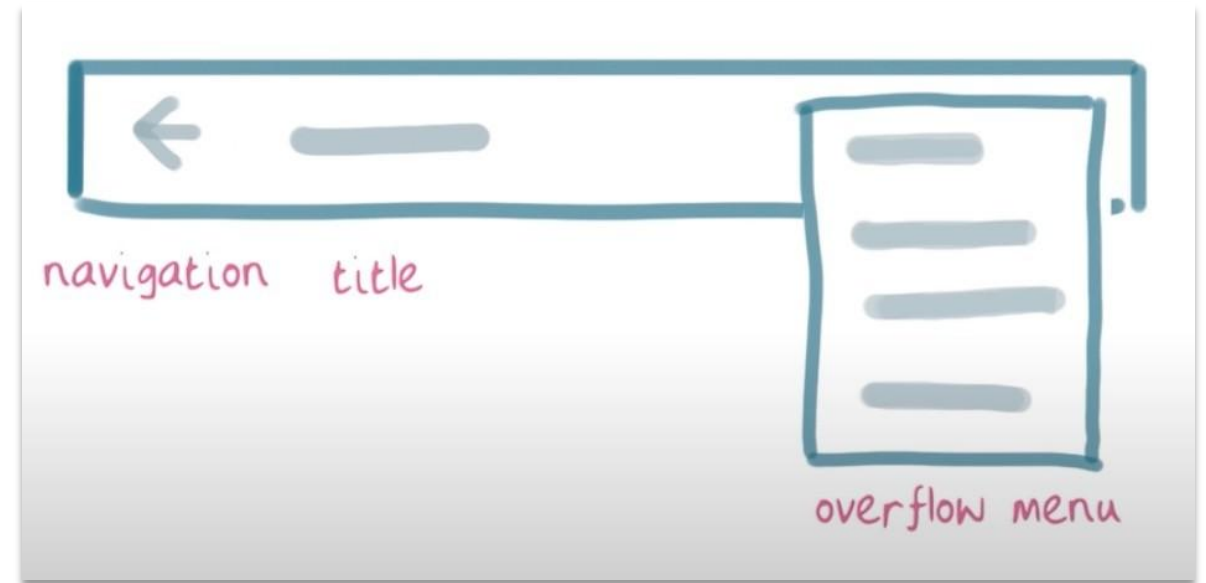
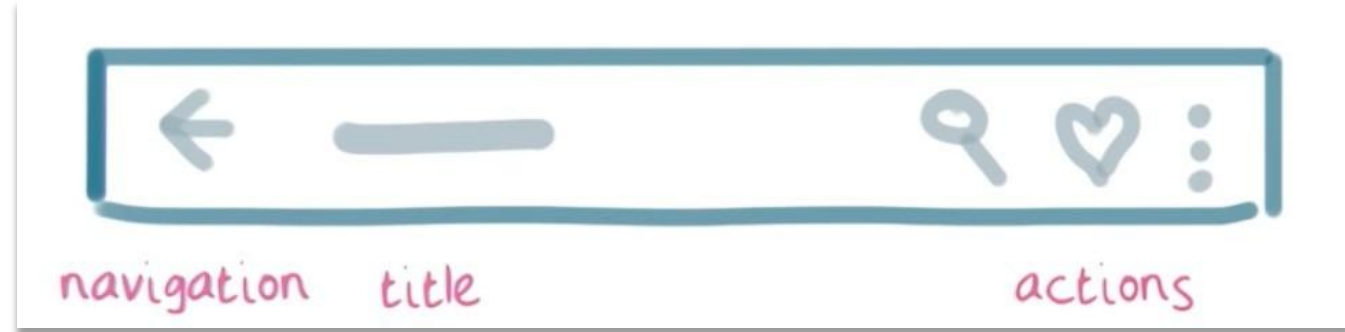
**TOOLBAR**

APP BAR

TABS

NAVIGATION DRAWER

SCROLLING AND PAGING



# Design Patterns in (Android) Mobile Apps

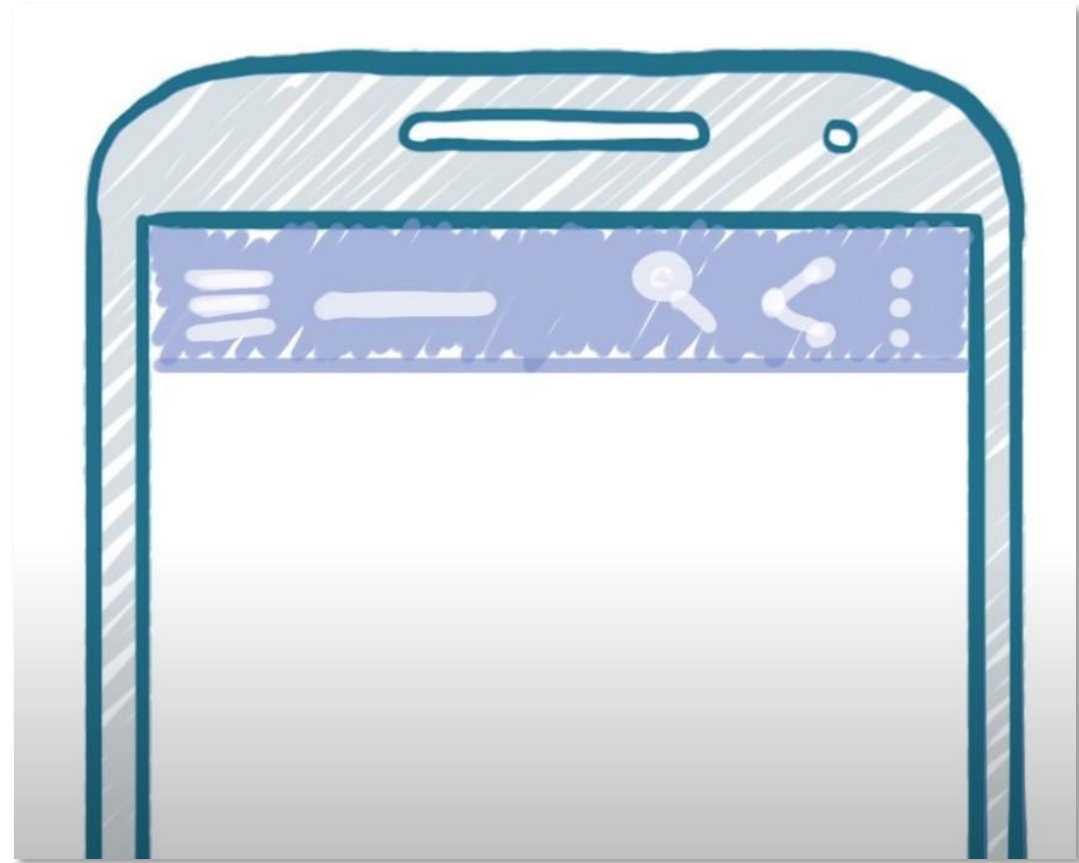
TOOLBAR

**APP BAR**

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SCROLLING AND PAGING



# Design Patterns in (Android) Mobile Apps

TOOLBAR

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# Design Patterns in (Android) Mobile Apps

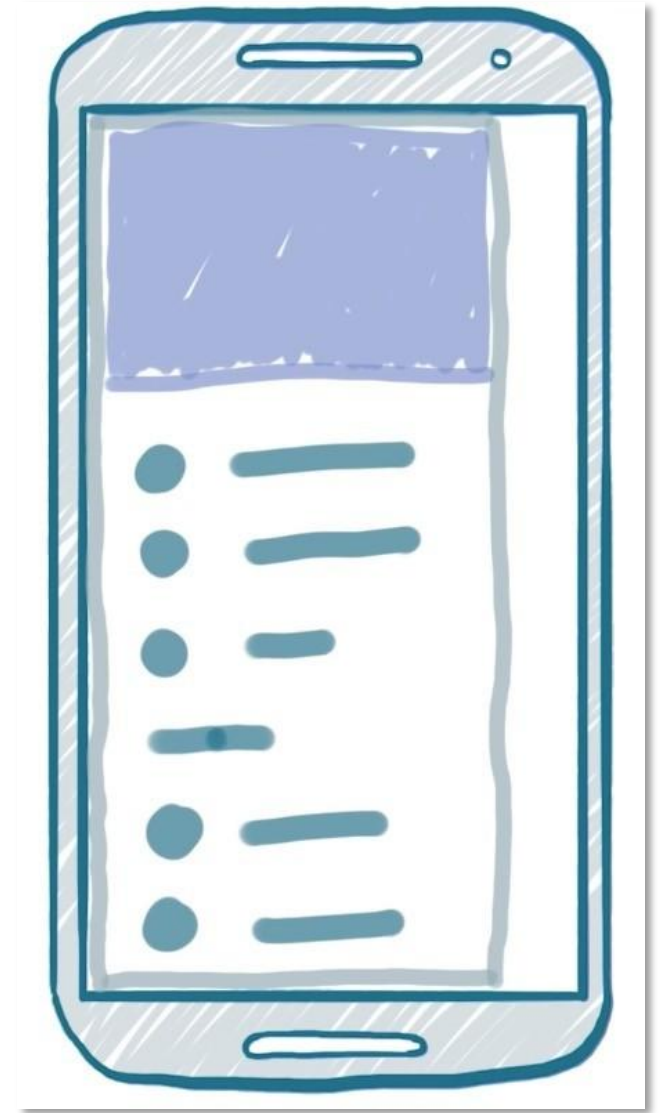
TOOLBAR

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SCROLLING AND PAGING



# Design Patterns in (Android) Mobile Apps

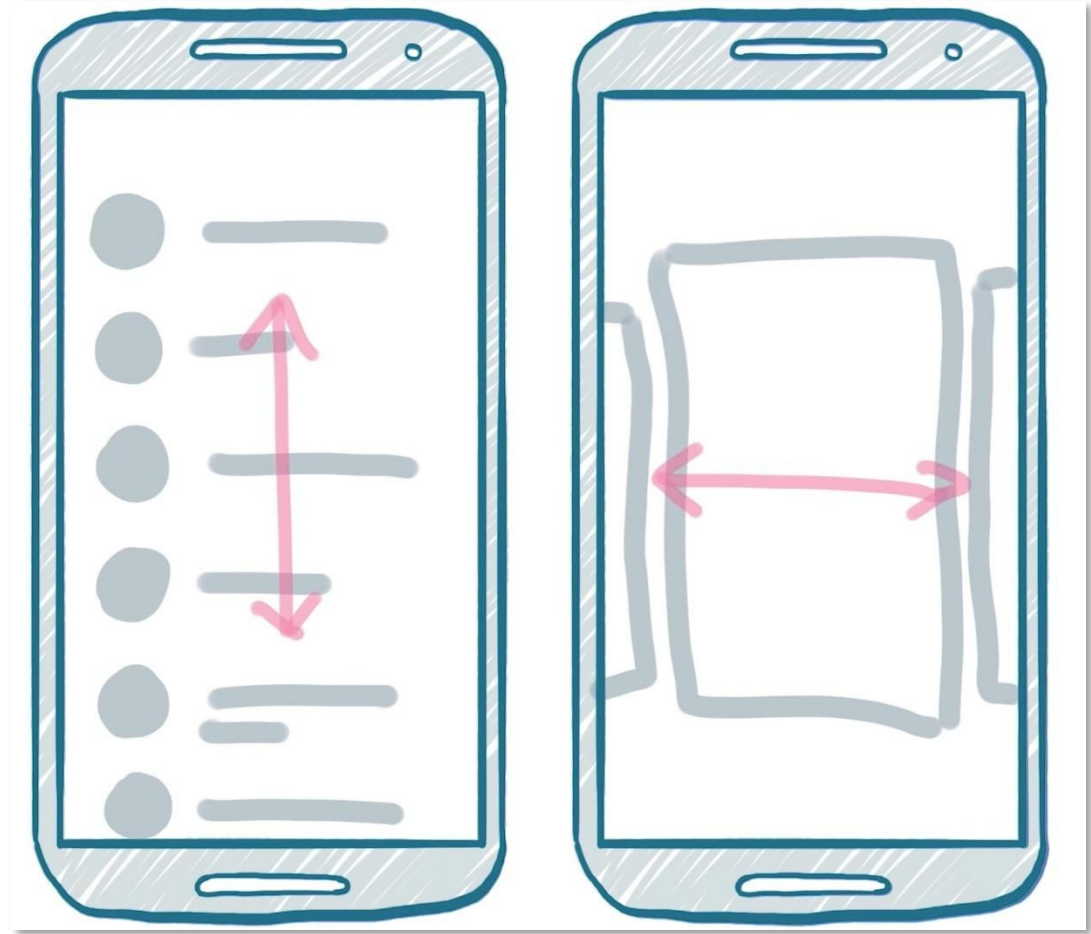
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**SCROLLING AND PAGING**



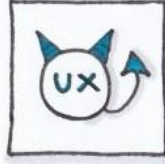


# Dark Patterns

Deceptive designs that go against users' best interests

# Dark Patterns

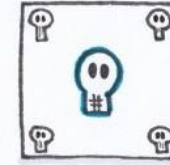
- The term “dark pattern” was coined in 2010 by **Harry Brignull**, a design practitioner
- The aim was to include all those designs that are **deliberately** adopted to promote choices that are not in the user’s best interest



# DARK PATTERNS

©KRISZTINA SZEROVAY  
WWW.SKETCHINGFORUX.COM

UX Knowledge Base Sketch #29



DARK PATTERNS ARE



## TRICKS

THAT MAKE THE USERS DO THINGS THEY DID NOT MEANTO.

FINE LINE BETWEEN  
INFLUENCING USERS'  
BEHAVIOR AND  
TRICKING THEM!

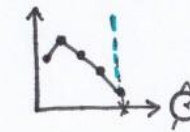
DARK PATTERNS CAN WORK  
IF SOMEONE IS LOOKING FOR  
SHORT-TERM RESULTS.



ONLY INITIAL  
SUCCESS, NOT  
SUSTAINABLE

vs.

USING DARK PATTERNS  
HAS A NEGATIVE IMPACT  
IN THE LONG-TERM



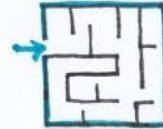
USERS WILL  
SWITCH TO  
MORE ETHICAL  
PRODUCTS / SERVICES

## THE MOST COMMON TYPES



### FORCED CONTINUITY

FREE TRIAL → CHANGES  
TO A PAYING SCHEME WITHOUT  
WARNING



### ROACH MOTEL

THE START IS EASY  
(SIGNUP/SUBSCRIPTION),  
QUITTING IS HARD



### GROWTH HACKING THROUGH SPAMMING

YOU BECOME THE SPAMMER  
WITHOUT KNOWING IT



### DELIBERATE MISDIRECTION

FOCUSING THE USERS' ATTENTION  
ON THE MORE EXPENSIVE OPTION,  
HIDING THE CHEAPER WAY



### OBSCURED PRICING

MAKING IT HARD TO  
COMPARE THE PRICES



### SNEAK INTO BASKET

A RANDOM ADDITIONAL ITEM  
APPEARS IN YOUR BASKET  
(WITHOUT YOUR CONSENT)



### BAIT & SWITCH

USE A CONVENTION, PATTERN  
IN A WAY TO MAKE THE USER  
FALSELY ASSUME SOMETHING



### DISGUISED ADS

AN AD LOOKING LIKE  
ANOTHER TYPE OF CONTENT  
/ NAVIGATION



### ROADBLOCK

A POP-UP INTERRUPTS YOUR  
INTENDED ACTION



### HIDDEN COSTS

AT THE CHECKOUT, A NEW,  
UNEXPECTED COST APPEARS



### PRIVACY ZUCKERING

SHARING MORE PRIVATE INFO  
THAN YOU WANT



### MISINFORMATION

E.G. CONFUSING  
COLOR, CONTRAST  
LANGUAGE

TRICK  
QUESTIONS  
CHECK BOX  
TREACHERY

# Dark Patterns

- **Harry Brignull** published a gallery of dark patterns on the [www.darkpatterns.org](http://www.darkpatterns.org)
- He launched an hall of shame campaign on Twitter using the hashtag **#darkpatterns**

# Dark Patterns ... or Deceptive Designs

- Many organizations are moving away from the oppressive terminology typical in computer science
  - For example from “master/slave” to “parent/child” and from “blacklist” to “block list”
- In the case of “dark patterns,” the association of “dark” with harm is problematic
  - it may reinforce the racist heuristic of viewing people with darker skin tones as evil (i.e., the “bad is black” effect)
- There are nowadays alternative names for dark patterns as well, such as **deceptive designs**

# Attention-Capture Damaging Patterns

A particular kind of dark patterns

# Attention Economy

- Why is our digital well-being undermined by contemporary technology?
- Most of the contemporary tech-companies adopt a business model that is called the “Attention Economy”
  - Our **attention** is transformed into a **currency**
  - We «**pay**» for a service with the time we spend on it
  - Tech companies **may sell** our attention (and our data, sometimes) to advertising companies
- This business model is convenient
  - **Alphabet** (the company that owns Google) is worth \$1 trillion
  - **Meta** (which owns Facebook, Instagram and WhatsApp) is worth about \$700 billion



# Attention Economy

## 2020 This Is What Happens In An Internet Minute



## 2021 This Is What Happens In An Internet Minute





# Attention-Capture Damaging Patterns: Definition

- A recurring pattern in digital interfaces that a designer **uses to** exploit psychological vulnerabilities and **capture attention**, often leading the user to lose **track of their goals**, lose their **sense of time and control**, and later **feel regret**
- The goal of ACDPs is to maximize continuous usage, daily visits, and interactions (e.g., clicks, shares, likes, etc.).
- They make users more likely to visit a digital service again and click on similar types of rewarding content, thus creating a «**trap**» for the user that enables the **stakeholder's goal**

# Attention-Capture Damaging Patterns: Strategies

- Typically, they ACDPs the need for autonomous decision making by "automating" processes and functions
- Paradoxically, they can **improve the usability** of a platform
- They exploit users' **psychological vulnerabilities**:
  - Variable reward
  - Immediate gratification
  - [...]

# Attention-Capture Damaging Patterns: Strategies

- The exploited psychological vulnerabilities can be of various type:
  - Notifications (with their vibrations, flashing LEDs ...) mimic danger signals that we may experience in “offline” life
  - The possibility of receiving new comments or likes keeps us in a persistent state of alert (**variable reward**)
  - Every time we receive a comment or a “like,” our brain gets a dose of dopamine, prompting us to compare ourselves with others (**social influence**)
  - In general, today’s technology is designed to keep us “engaged,” offering us a mix of old and new content each time
    - a mechanism that is used by **slot machines**, too

# Attention-Capture Damaging Patterns: Impacts

- ACDPs may negatively affect people's digital well-being
  - They promote “**digital addiction**”
  - They undermine users' **attention** and **productivity**
  - They undermine users' **sense of agency** and self-control
  - They result in a later **sense of regret**

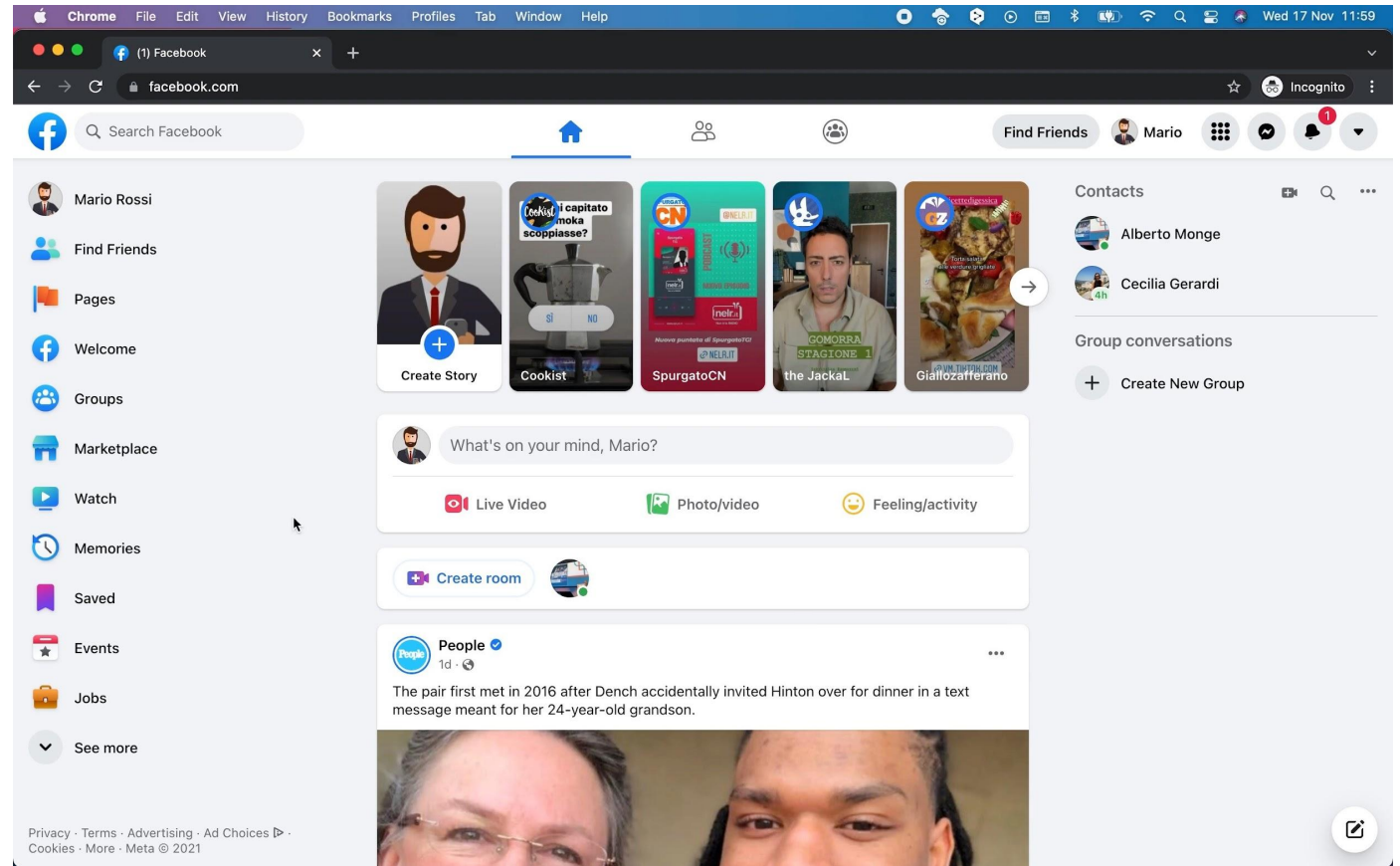
# Attention-Capture Damaging Patterns: Examples

**GUILTY-PLEASURE  
RECOMMENDATIONS**

NEVERENDING AUTOPLAY

CASINO PULL-TO-REFRESH

INFINITE SCROLLING



# Attention-Capture Damaging Patterns: Examples

## **GUILTY-PLEASURE RECOMMENDATIONS**

NEVERENDING AUTOPLAY

CASINO PULL-TO-REFRESH

INFINITE SCROLLING

- They are based on:
  - Previous user's interactions (**Content-Based**)
  - Preferences of similar users (**Collaborative Filtering**)
- Recommendations are useful if the goal of the platform matches the user's goals (**value-alignment problem**)
- They can become a «**trap**» for keeping the user's attention on the platform against the user's will
- They exploit **variable reward techniques**

# Attention-Capture Damaging Patterns: Examples

GUILTY-PLEASURE  
RECOMMENDATIONS

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CASINO PULL-TO-REFRESH

INFINITE SCROLLING



# Attention-Capture Damaging Patterns: Examples

GUILTY-PLEASURE  
RECOMMENDATIONS

**NEVERENDING AUTOPLAY**

CASINO PULL-TO-REFRESH

INFINITE SCROLLING

- A new video is **automatically played** when the current one finishes. There is never a point for the user to **stop** and **reflect**, and the option to turn off autoplay is hidden or non-existent
- Autoplay may be **useful** in some circumstances, e.g., listening to music on YouTube while working
- It can **prolong** usage sessions ( «*let me see this new video and then I will close the app!*» )
- It exploits **variable reward techniques**
- Reduces the **user's autonomy**



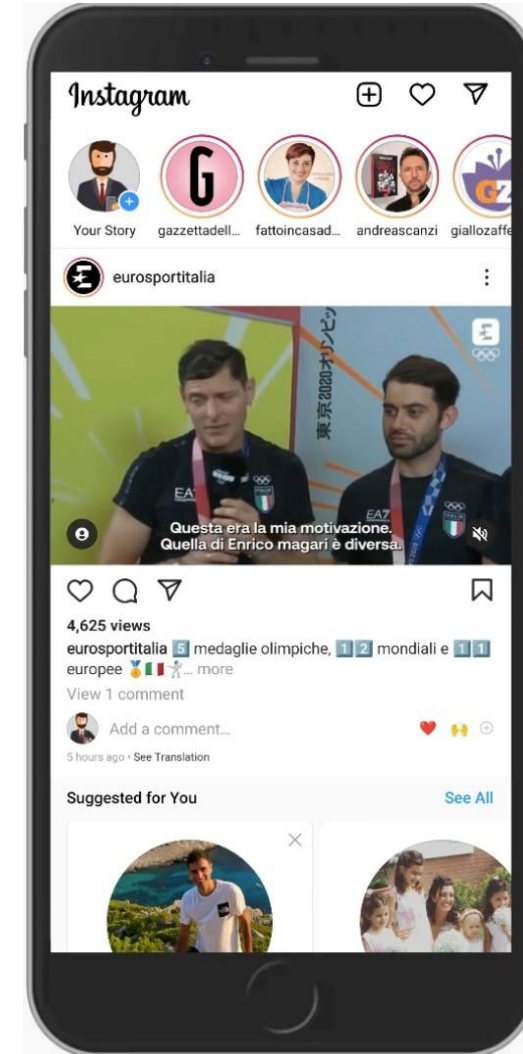
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# Attention-Capture Damaging Patterns: Examples

GUILTY-PLEASURE  
RECOMMENDATIONS

NEVERENDING AUTOPLAY

**CASINO PULL-TO-REFRESH**

INFINITE SCROLLING

- When the user **swipes down** on their smartphone, there is an **animated reload** of the page that **may or may not** reveal new appealing content.
- Users may be tempted to refresh compulsively, hoping to receive new content
- It exploits **variable reward techniques**
- Similar to **slot machines**

# Attention-Capture Damaging Patterns: Examples

GUILTY-PLEASURE  
RECOMMENDATIONS

NEVERENDING AUTOPLAY

CASINO PULL-TO-REFRESH

**INFINITE SCROLLING**



# Attention-Capture Damaging Patterns: Examples

GUILTY-PLEASURE  
RECOMMENDATIONS

NEVERENDING AUTOPLAY

CASINO PULL-TO-REFRESH

**INFINITE SCROLLING**

- As the user scrolls down a page, more content **automatically** and **continuously loads** at the bottom.
- It **decreases** the **effort** required to browse content
- Promotes “**endless**” usage sessions
- It exploits **variable reward techniques**

# References

- Some material from
  - <https://hci.stanford.edu/courses/cs147/2022/wi/lectures/16-design-patterns.pdf>
  - <https://hci.rwth-aachen.de/cthci-ss2020>
  - [https://www.youtube.com/watch?v=aB6us\\_txi54](https://www.youtube.com/watch?v=aB6us_txi54)

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