



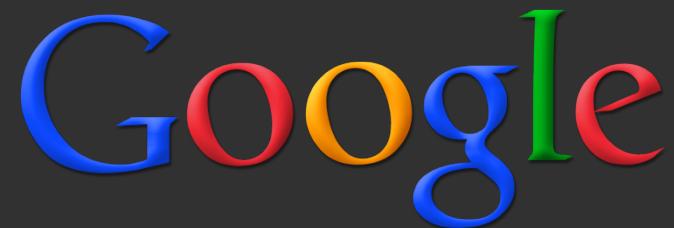
# Dart

One language to rule them all ...

Sébastien Deleuze - [@sdeleuze](https://twitter.com/sdeleuze)

# Disclaimer

Cette présentation comporte de nombreuses hypothèses non confirmées officiellement par

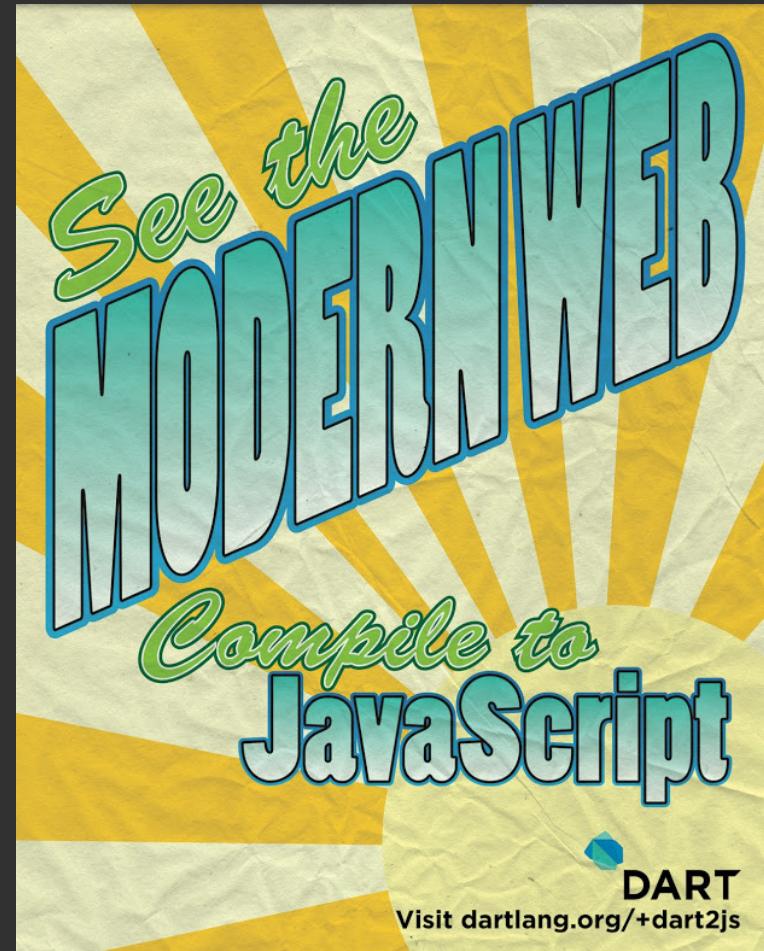


# Dart, c'est quoi exactement ?

Un langage structuré et flexible  
pour les développements Web  
(mais pas que)

Destiné aux navigateurs modernes

Pour améliorer la  
maintenabilité et l'efficacité de nos  
développements



# Une plateforme

Langage

Documentation

Outilage

Bibliothèques

Machines  
virtuelles

IHM à base de  
composants

Compilateur  
Dart / Javascript

Dépôt de paquets



# Remplacer Javascript ?

Non, Google suit 2 pistes en parallèle ...



Peu de prise de risque  
Gains potentiels faibles



Grosse prise de risque  
Gains potentiels importants

# Qui contribue ?

ager@google.com  
ahe@google.com  
ajohnsen@google.com  
alanknight@google.com  
alexeif@google.com  
amouravski@google.com  
amshali@google.com  
antonm@google.com  
aprelev@gmail.com  
arv@google.com  
asiva@google.com  
bak@google.com  
benl@google.com  
benwells@google.com  
blois@google.com  
brianwilkerson@google.com  
codefu@google.com  
cshapiro@google.com  
danrubel@google.com  
dcarlson@google.com  
devoncarew@google.com  
dgrove@google.com

100 contributeurs  


16 contributeurs  
externes

Très nombreux échanges  
avec la communauté

# Maitrise technologique et gestion du risque

ORACLE®

Google



Microsoft

# Unifier le développement d'applications



Web



Serveur



Mobile



Script



Desktop

# Langage

Orienté objet et typage optionnel

```
import 'dart:math';

class Point {
    num x, y;

    Point(this.x, this.y);

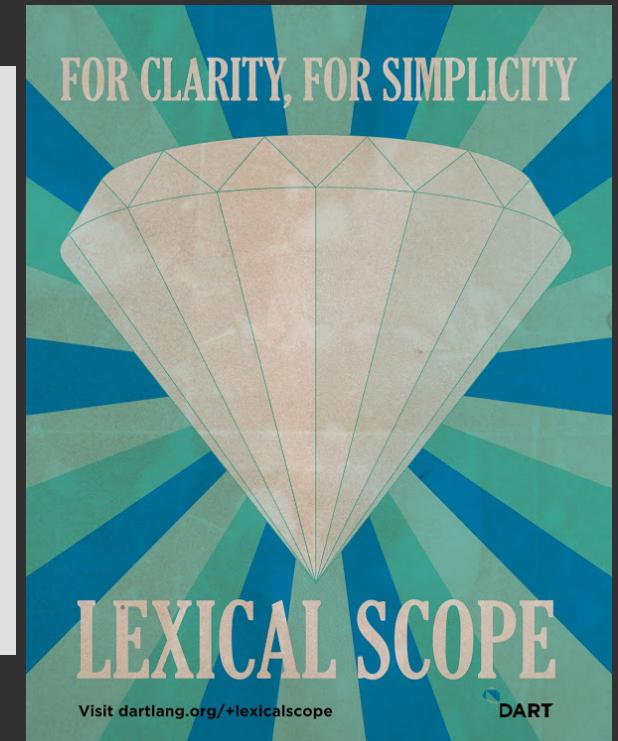
    num distanceTo(Point other) {
        var dx = x - other.x;
        var dy = y - other.y;
        return sqrt(dx * dx + dy * dy);
    }
}

main() {
    var a = new Point(2, 3);
    var b = new Point(3, 4);
    print('distance from a to b = ${a.distanceTo(b)}');
}
```

# Langage

This version Javascript

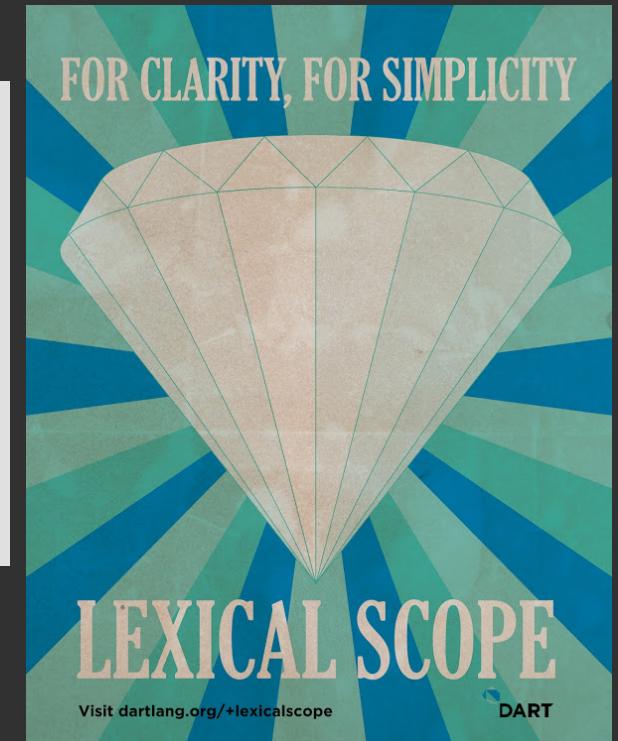
```
function Awesome() {}  
Awesome.prototype.cool = function() {  
  alert("inside awesome");  
}  
Awesome.prototype.init = function(button) {  
  button.addEventListener("click", function() {  
    this.cool(); // this won't work!  
  });  
}  
var button = document.getElementById("b");  
var a = new Awesome(); a.init(button);
```



# Langage

This version Dart

```
class Awesome {  
    cool() =>  
        window.alert("inside cool");  
    init(button) =>  
        button.onClick.listen((e) => cool());  
}  
void main() {  
    new Awesome().init(document.query("#b"));  
}
```



# Langage Fonctions

```
[0, 1, 2, 3].where((n) => n.isEven).foreach(print);
```

# Langage

## Interfaces implicites

```
class Person {  
    final _name;  
    Person(this._name);  
    String greet(who) => 'Hello, $who. I am ${_name}.';  
}
```

*// Same implicit interface than*

```
class Person2 {  
    String greet(who);  
}
```

```
class Bro implements Person {  
    String greet(who) => 'Hi $who. What's up?';  
}
```

# Langage

## Paramètres optionnels et valeurs par défaut

```
String say(String from, String msg, [String channel='email']) {  
    // ...  
}  
  
main() {  
    say('Bob', 'Howdy');  
    say('Bob', 'Howdy', 'smoke signal');  
}
```

## Paramètres nommés et valeurs par défaut

```
enableFlags({bool bold: false, bool hidden: false}) {  
    // ...  
}  
  
main() {  
    enableFlags();  
    enableFlags(bold: true);  
    enableFlags(bold: true, hidden: false);  
}
```

# Langage Mixins

```
import 'dart:async';

class Person {
  String name;
  Person(this.name);
}

class Womanizer {
  pickUpTheseWomen() => print("Challenge Accepted!");
}

class Bro {
  legendary() {
    print("This is gonna be, wait for it ...");
    new Timer(new Duration(seconds:5), () => print("legendary!"));
  }
}

class BarneyStinson extends Person with Bro, Womanizer {
  BarneyStinson(name): super(name);
}
```

# Un langage facile à apprendre



I am watching you !



# API

dart:async

dart:chrome

dart:collection

dart:core

dart:crypto

dart:html

dart:indexed\_db

dart:io

dart:isolate

dart:json

dart:math

dart:mirrors

dart:svg

dart:typeddata

dart:uri

dart:utf

dart:web\_audio

dart:web\_gl

dart:web\_sql

args

fixnum

intl

logging

matcher

meta

mock

serialization

source\_maps

unittest

# API

dart:html

```
import 'dart:html';

main() {

  var message = query('#msg');

  var b = new ButtonElement()
    ..classes.add('important')
    ..text = 'Bro Code'
    ..onClick.listen((e) => message.text = '"A bro does not dare/challenge
another bro to do anything they wouldn\'t try them self"');

  document.body.children.add(b);

}
```

# API

## dart:io

```
import 'dart:io';

main() {
  HttpServer.bind('127.0.0.1', 8080).then((server) {
    server.listen((HttpRequest request) {
      request.response
        ..write('A bro cannot give another bro a Teddy bear')
        ..close();
    });
    print('web server started !');
  });
}
```

# API

## dart:isolate

```
import 'dart:isolate';

main() {
  var sendPort = spawnUri('plugin.dart');
  sendPort.call('getPluginMetadata').then(
    (reply) {
      print(reply);
    });
}
```

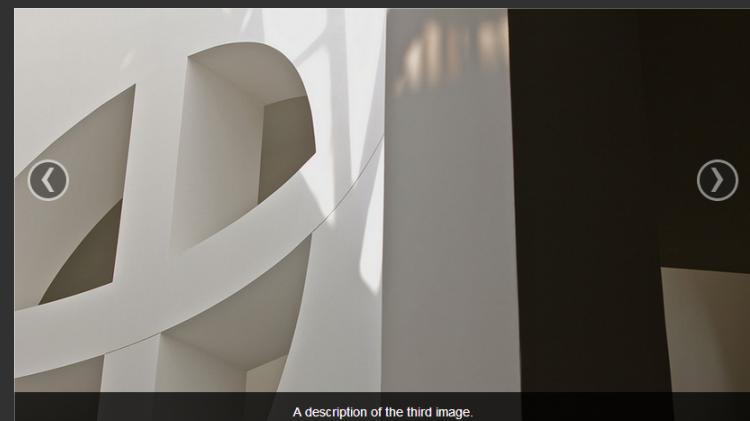
GETTING TANGLED IN THREADS?  
**TRY ISOLATES!**



# Web UI

```
<element name="x-carousel" extends="div" constructor="Carousel">
  <template>
    <style type='text/css'> ... </style>
    <div class='carousel'>
      <x-swap>
        <content></content>
      </x-swap>
      <a class="left" on-click='previous()'>&lsaquo;</a>
      <a class="right" on-click='next()'>&rsaquo;</a>
    </div>
  </template>
</element>
```

```
<x-carousel>
  <figure>
    
    <figcaption>Description 1</figcaption>
  </figure>
  <figure class="active">
    
    <figcaption>Description 2</figcaption>
  </figure>
</x-carousel>
```

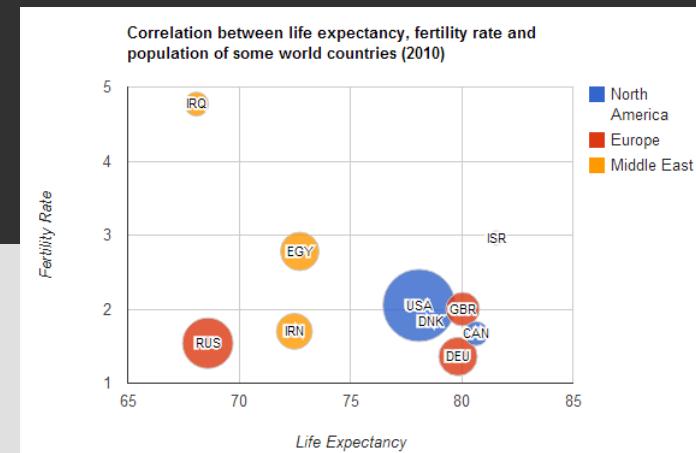


# JS Interop

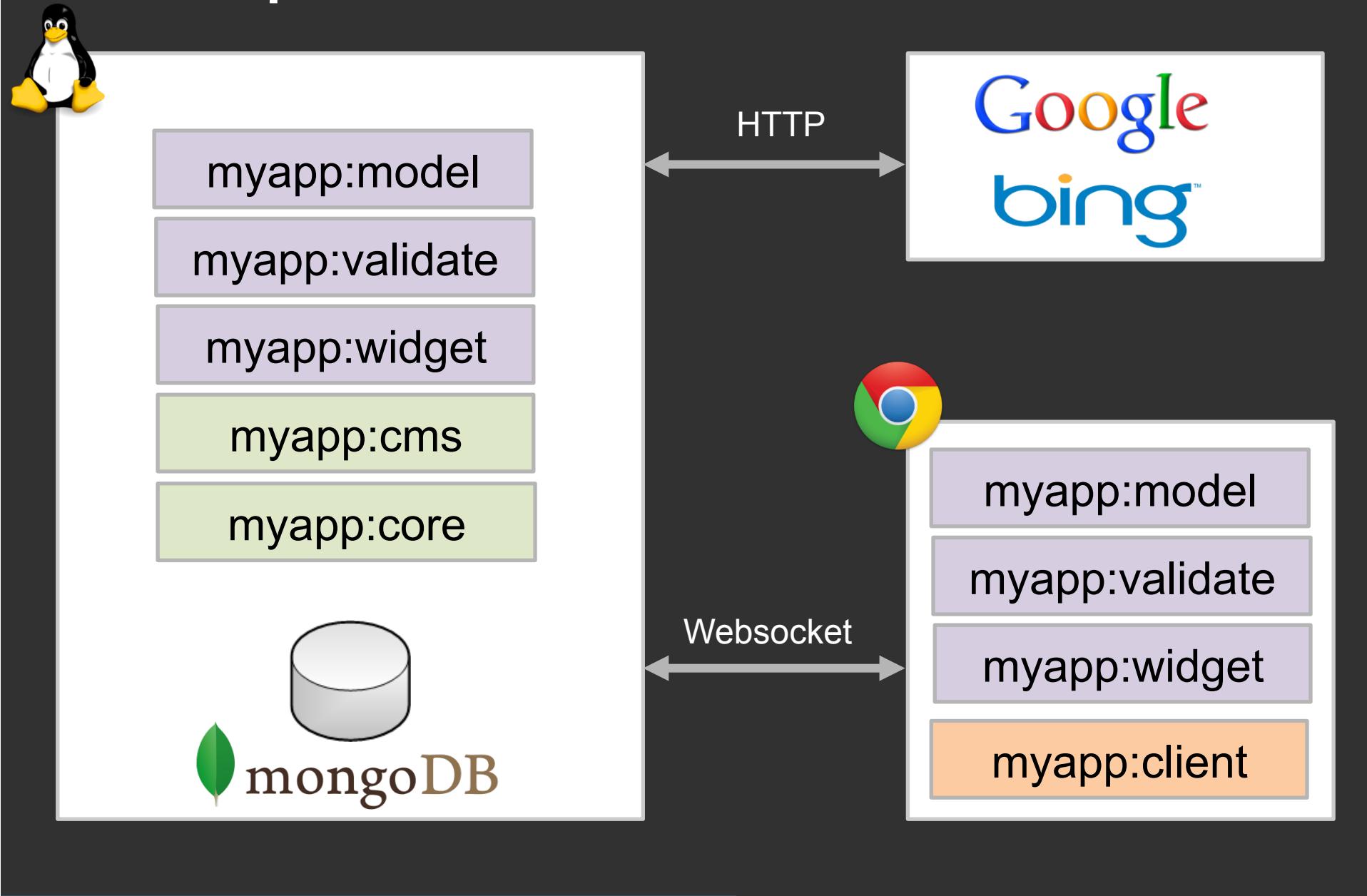
```
import 'dart:html';
import 'package:js/js.dart' as js;

void draw() {
  var gviz = js.context.google.visualization;
  var listData = [ ... ];
  var arrayData = js.array(listData);
  var tableData = gviz.arrayToDataTable(arrayData);
  var options = js.map({ 'title': 'Correlation'});
  var chart = new js.Proxy(gviz.BubbleChart, query('#viz'));
  chart.draw(tableData, options);
}

main() {
  js.context.google.load('visualization', '1',
    js.map( { 'packages': ['corechart'],
      'callback': new js.Callback.once(draw) }));
}
```

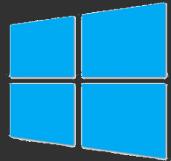


# Exemple d'architecture



# Environnements d'exécution

Aujourd'hui



VM Serveur



VM navigateur



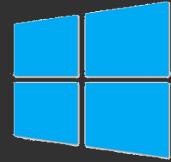
Cloud



dart2js

# Environnements d'exécution

Demain



VM Serveur



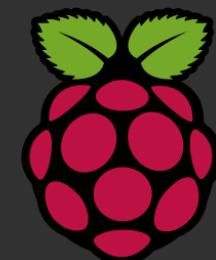
VM navigateur



Cloud



dart2js



ARM / Android



#dartlang #mixit13

# Environnements d'exécution

## Android

<a href="#">object_x64_test.cc</a>	10 months ago	Ensure objects emitted in code are allocated in old space. [cshapiro@google.com]
<a href="#">os.h</a>	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
<a href="#">os_android.cc</a>	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
<a href="#">os_linux.cc</a>	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
<a href="#">os_macos.cc</a>	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
<a href="#">os_test.cc</a>	3 months ago	Increase timeout jitter [sgjesse@google.com]
<a href="#">os_win.cc</a>	8 days ago	Fix dartbug.com/10415: [iposva@google.com]

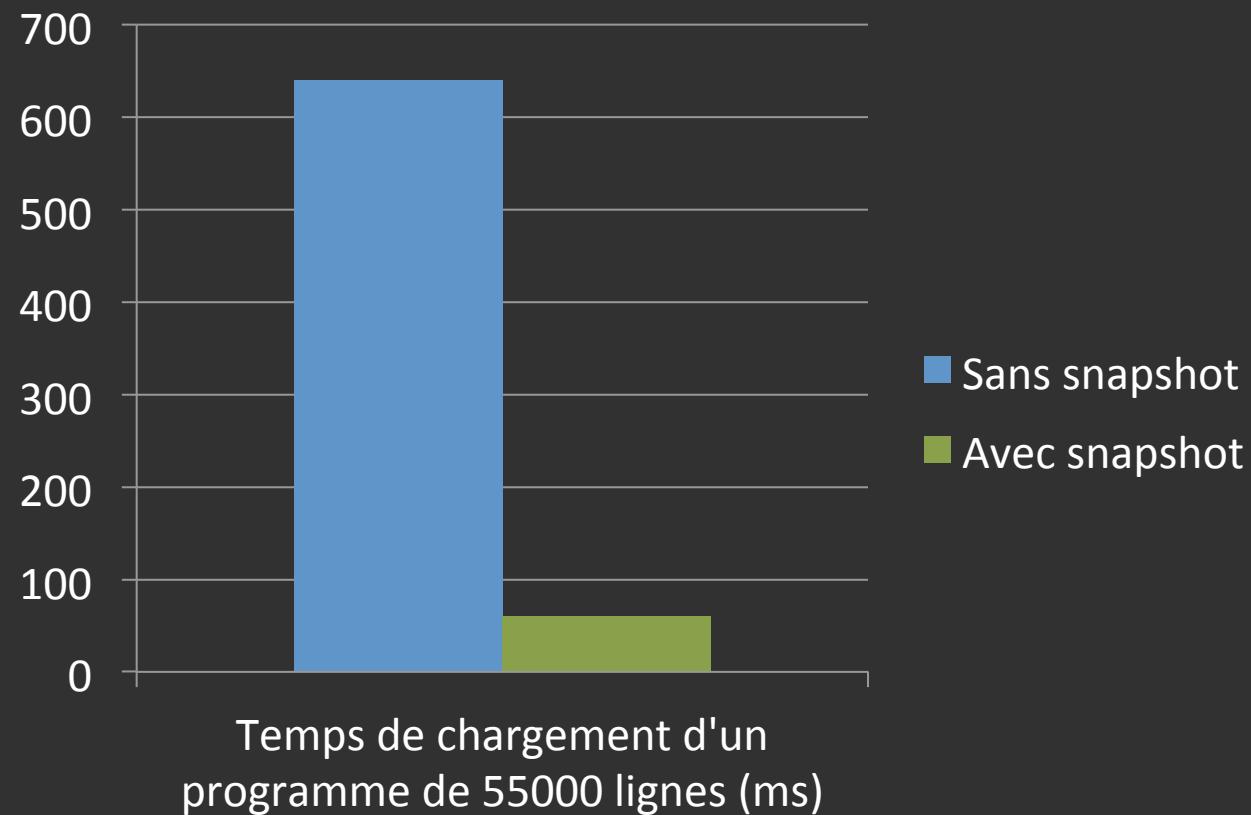
<a href="#">constants_x64.h</a>	12 days ago	Introduce architecture specific headers describing Dart stack frames. [regis@google.com]
<a href="#">cpu.h</a>	11 months ago	Fix issue 1968, replace usage of inline 'asm' constructs in 'stack al... [asiva@google.com]
<a href="#">cpu_arm.cc</a>	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
<a href="#">cpu_ia32.cc</a>	11 months ago	Fix issue 1968, replace usage of inline 'asm' constructs in 'stack al... [asiva@google.com]
<a href="#">cpu_mips.cc</a>	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
<a href="#">cpu_test.cc</a>	8 days ago	Fix dartbug.com/10415: [iposva@google.com]
<a href="#">cpu_x64.cc</a>	11 months ago	Fix issue 1968, replace usage of inline 'asm' constructs in 'stack al... [asiva@google.com]
<a href="#">custom_isolate_test.cc</a>	23 days ago	Implements context allocation stub for MIPS. [zra@google.com]



#dartlang #mixit13

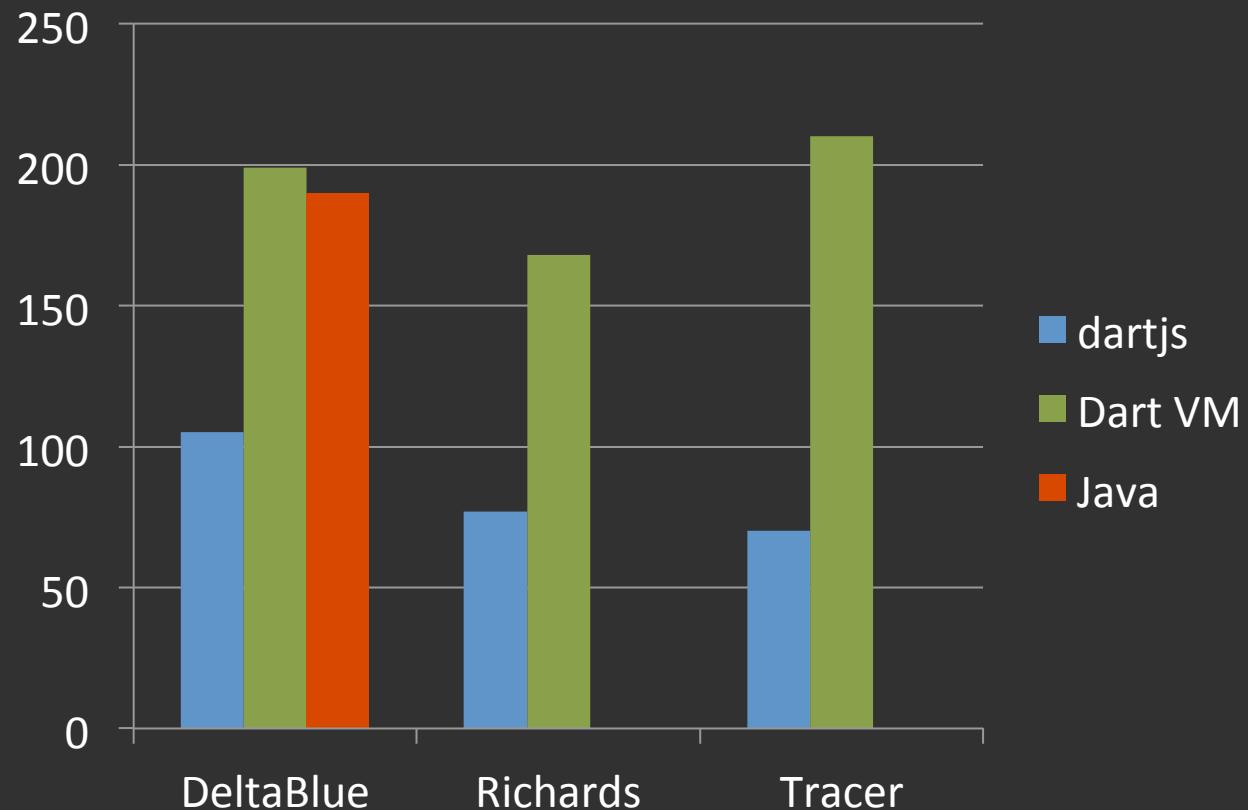
# Performance

## Démarrage



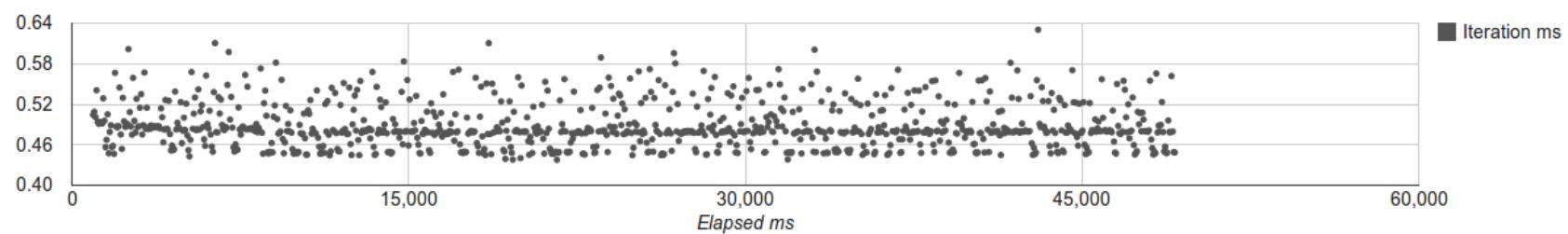
# Performance

## Exécution

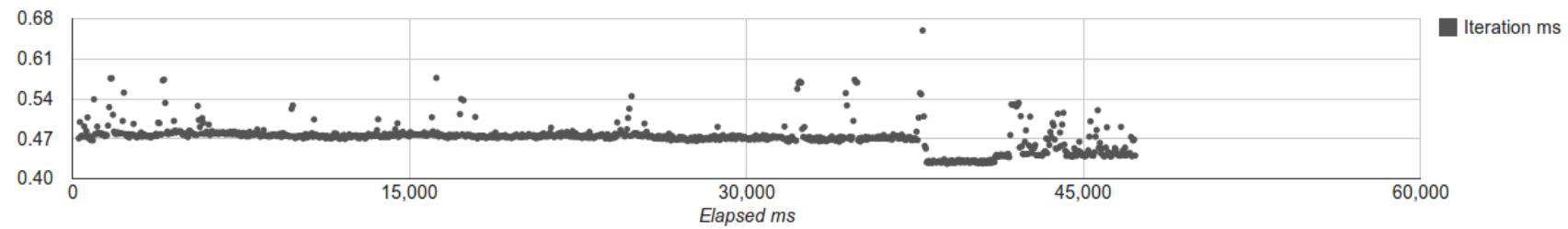


# Performance Exécution

JVM



DartVM



# Performance

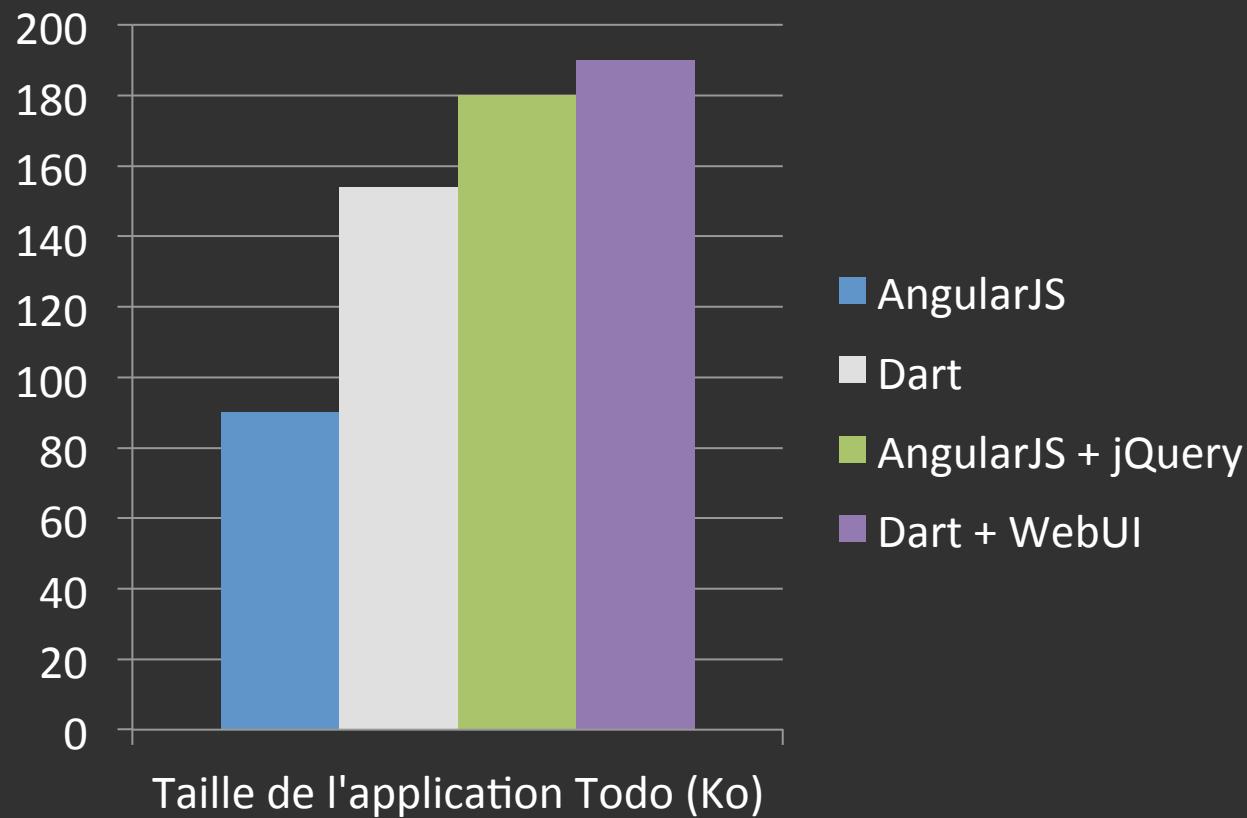
Single instruction, multiple data (SIMD)

```
var a = new Float32x4(1.0, 2.0, 3.0, 4.0);
var b = new Float32x4(5.0, 10.0, 15.0, 20.0);
var c = a + b;
```

$$\begin{array}{ccc} 1.0 & 5.0 & 6.0 \\ 2.0 & 10.0 & 12.0 \\ 3.0 & + & 12.0 \\ & & = \\ 4.0 & 20.0 & 24.0 \end{array}$$

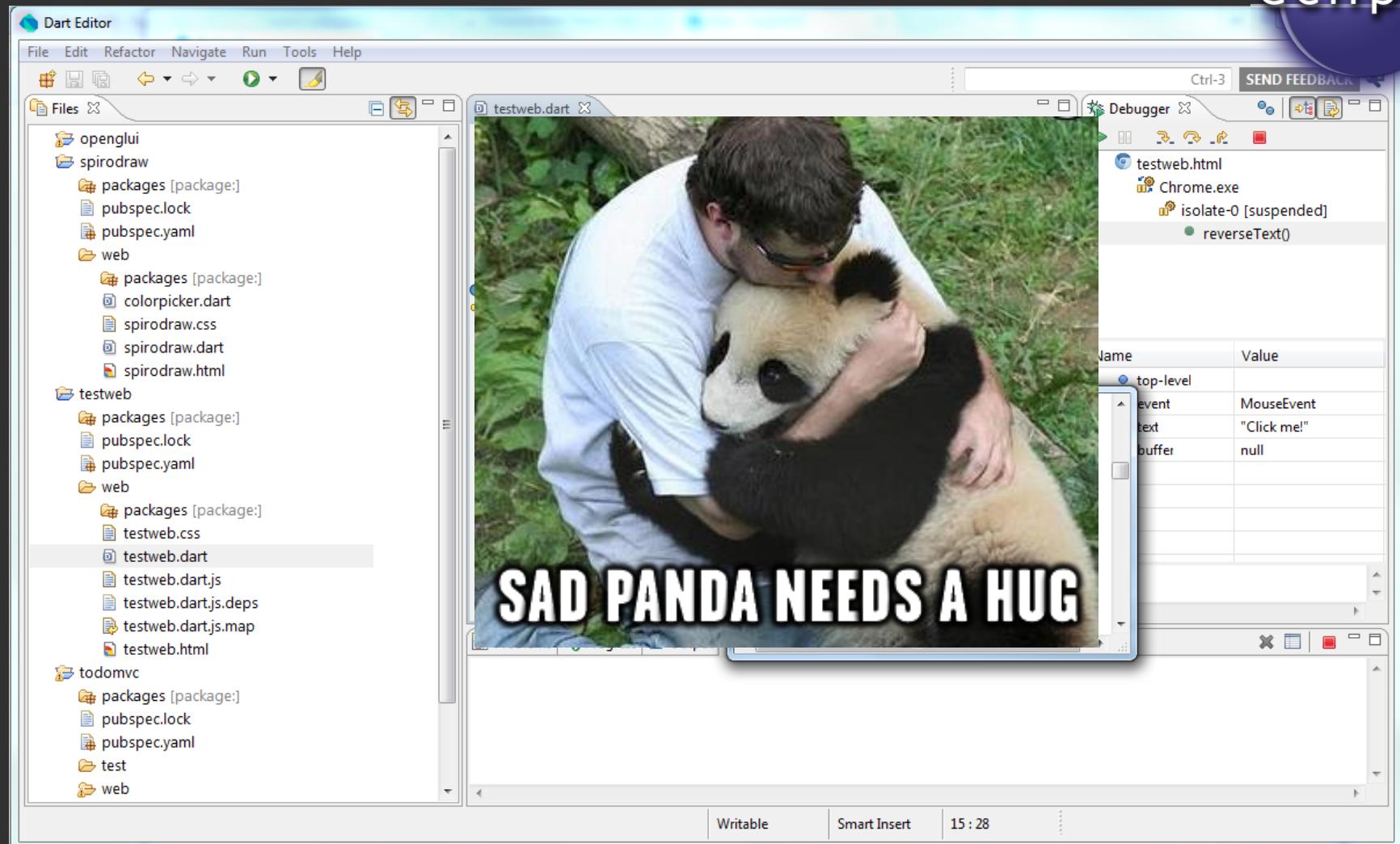
# Performance

Taille javascript générée



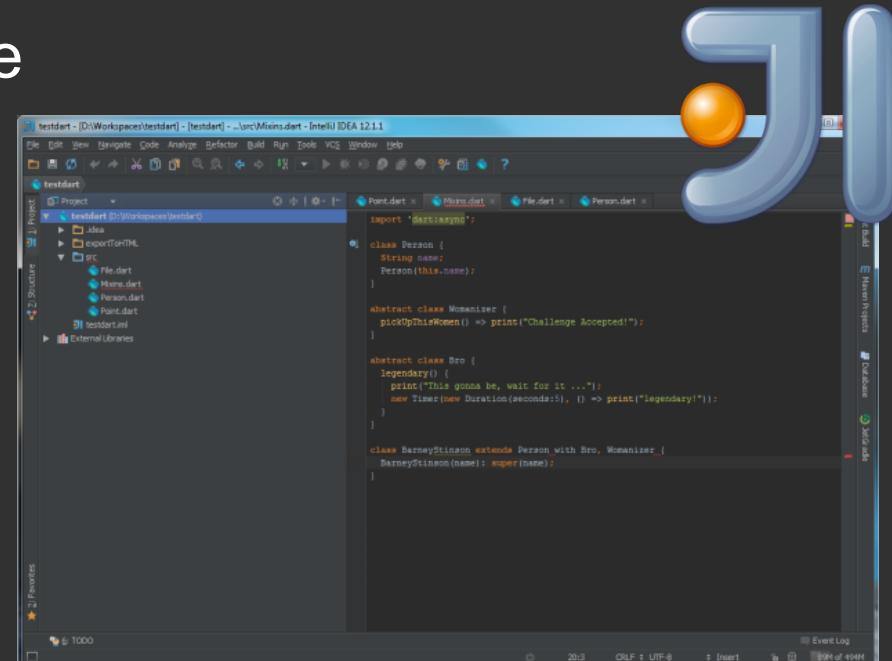
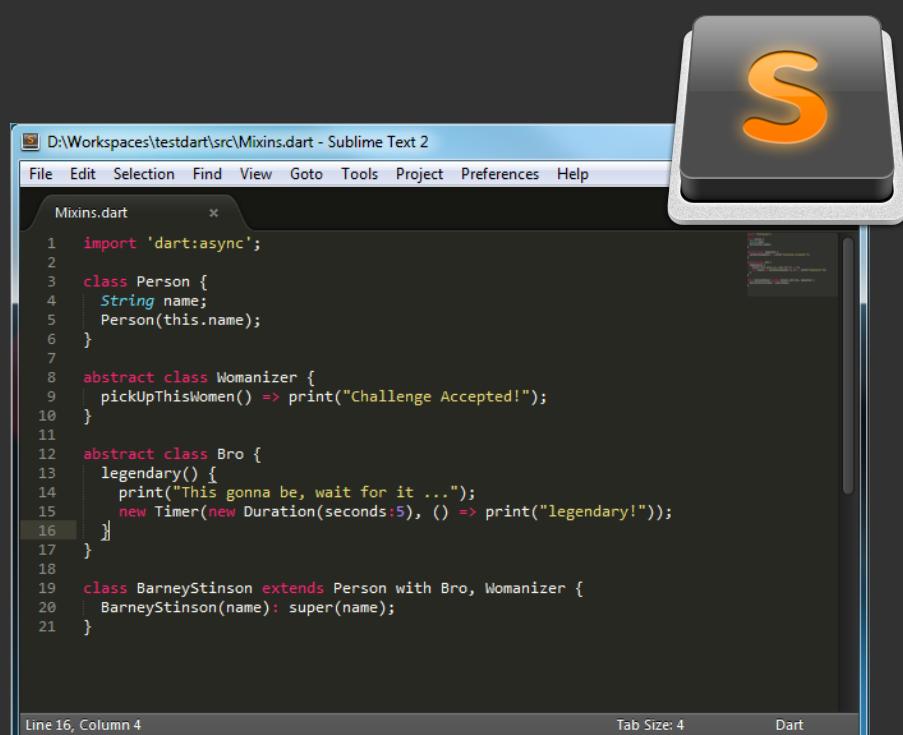
# Outilage

## IDE : Dart Editor



# Outilage

## IDE : pas obligé d'utiliser Eclipse



# Support de Dart dans Idea IntelliJ et WebStorm

# Externalisation du moteur d'auto-complétion

# Outilage

## Source maps



Paused in debugger



Sources Timeline Profiles Audits Console

html\_dart2js.dart spirodraw.dart

```
70     frontCanvas..height = height
71             ..width = width;
72     backCanvas..height = height
73             ..width = width;
74     clear();
75
76
77     void initControlPanel() {
78         inOrOut.onChange.listen((_) => refresh());
79         fixedRadiusSlider.onChange.listen((_) => refresh());
80         wheelRadiusSlider.onChange.listen((_) => refresh());
81         speedSlider.onChange.listen(onSpeedChange);
82         penRadiusSlider.onChange.listen((_) => refresh());
83         penWidthSlider.onChange.listen(onPenWidthChange);
84
85         colorPicker = new ColorPicker(paletteElement);
86         colorPicker.addListener((String color) => onColorChange(color));
87     }
```

R: null  
RUnits: null  
animationEnabled: true  
► back: CanvasRenderingContext2D  
► backCanvas: canvas  
colorPicker: null  
d: null  
dUnits: null  
► doc: document  
► fixedRadiusSlider: input#fixed\_radius  
► front: CanvasRenderingContext2D  
► frontCanvas: canvas#canvas  
height: null  
▼ inOrOut: select#in\_out.full
 ► 0: option
 ► 1: option
 accessKey: ""
 ► attributes: NamedNodeMap

# Outilage

## pub

```
name: myproject
version: 1.1.0
description: Sample application
author: Sébastien Deleuze
homepage: http://jyuro.org
documentation: http://jyuro.org/doc
dependencies:
  route: 0.4.5
  mustache : '>=0.1.5'
  mylib:
    git: git://github.com/jyuro/mylib.git
dev_dependencies:
  unittest: any
```



# Outilage

pub.dartlang.org

pub.dartlang.org    Getting Started    Docs    Packages    Search

## mustache 0.1.4

README.md    [Installing](#)    [Versions](#)

### Mustache templates

A Dart library to parse and render mustache templates.

[Passing](#) [drone.io](#)

### Example

```
import 'package:mustache/mustache.dart' as mustache;

main() {
    var source = '{{#names}}<div>{{lastname}}, {{firstname}}</div>{{/names}}';
    var template = mustache.parse(source);
    var output = template.renderString({'names': [
        {'firstname': 'Greg', 'lastname': 'Lowe'},
        {'firstname': 'Bob', 'lastname': 'Johnson'}
    ]});
    print(output);
}
```

### API

```
Template parse(String source, {bool lenient : false});
```

**About**  
Mustache template library

**Author**  
✉ Greg Lowe

**Homepage**  
<https://github.com/xxgreg/mustache>

**Uploader**  
greg.lowe

**Share**

# Outilage

## dartdoc

Dart API Reference > dart:core > Collection<E>

Search API

- args
- dart:async
- dart:chrome
- dart:collection
- dart:core
  - BidirectionalIterator<T>
  - bool
  - Collection<E>**
  - Comparable<T>
  - Comparator<T>
  - DateTime
  - double
  - Duration
  - Expando<T>
  - Expect
  - Function
  - int
  - InvocationMirror
  - Iterable<E>
  - Iterator<E>
  - List<E>
  - Map<K, V>
  - Match
  - num
  - Object
  - Pattern
  - RegExp

## Collection<E> abstract class

A collection of individual elements.

[Hide inherited](#)

A [Collection](#) contains some elements in a structure optimized for certain operations. Different collections are optimized for different uses.

A collection can be updated by adding or removing elements.

Collections are [Iterable](#). The order of iteration is defined by each type of collection.

*Deprecated:* This class is deprecated and will be removed soon.

Extends

[Iterable<E>](#) > [Collection<E>](#)

Subclasses

[DoubleLinkedQueue<E>](#) , [HashSet<E>](#) , [LinkedHashSet<E>](#) , [List<E>](#) , [ListQueue<E>](#) ,  
[Queue<E>](#) , [Set<E>](#)

Constructors

[const Collection\(\)](#)

Properties

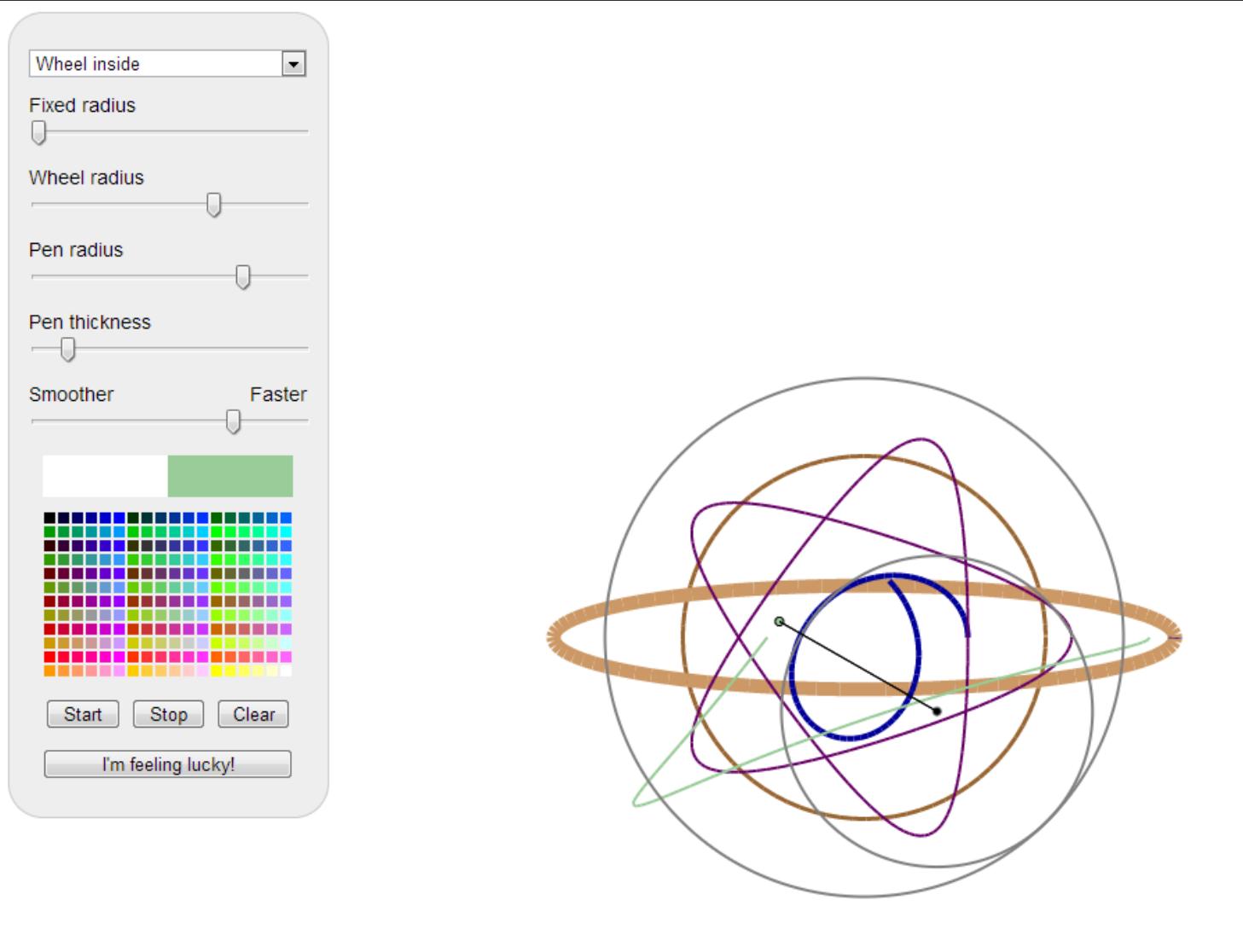
[final E first](#)

inherited from [Iterable](#)

Returns the first element.

If `this` is empty throws a [StateError](#). Otherwise this method is equivalent to  
`this.elementAt(0)`

# Applications

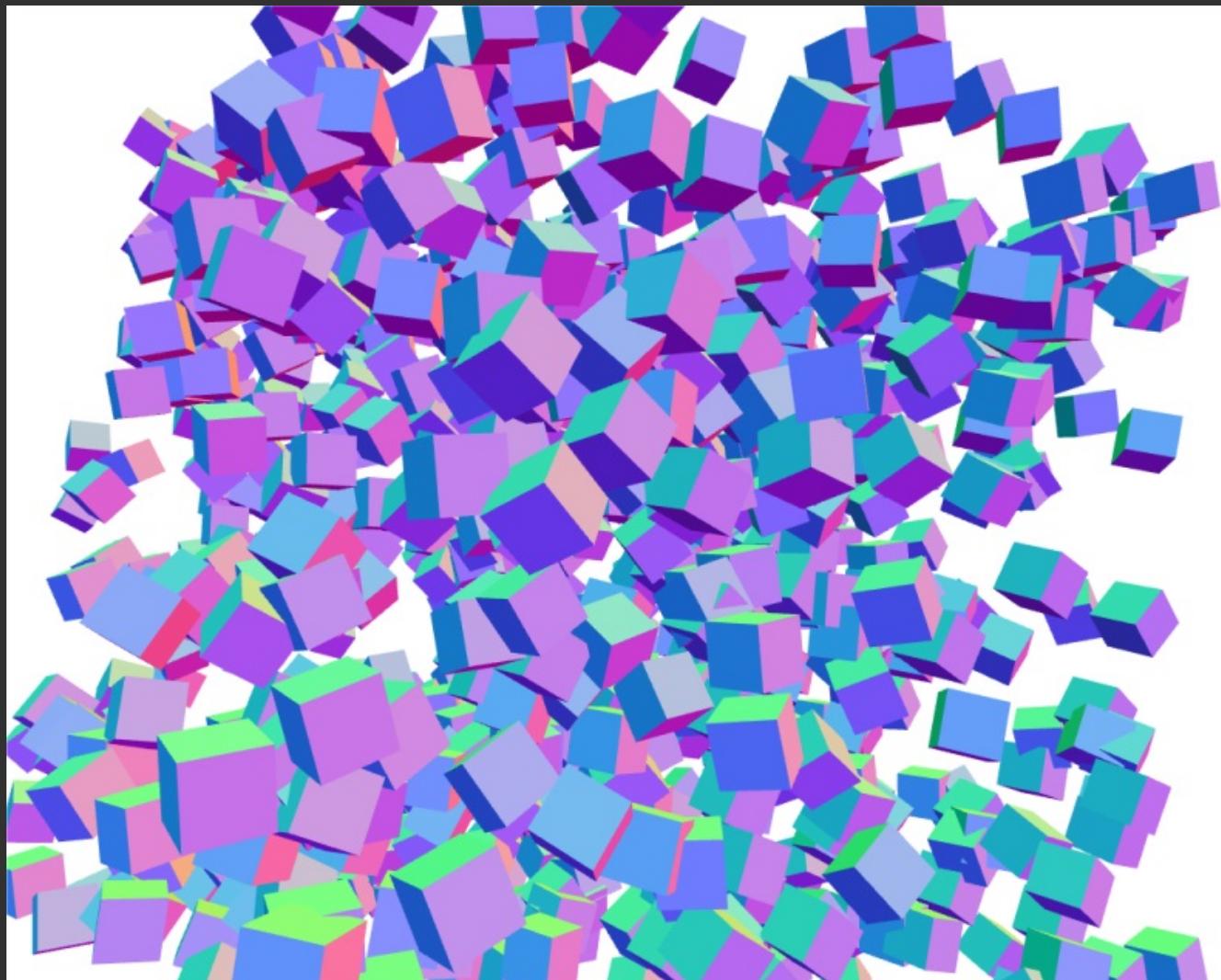


The image shows a digital application window titled "Wheel inside". The interface includes the following controls:

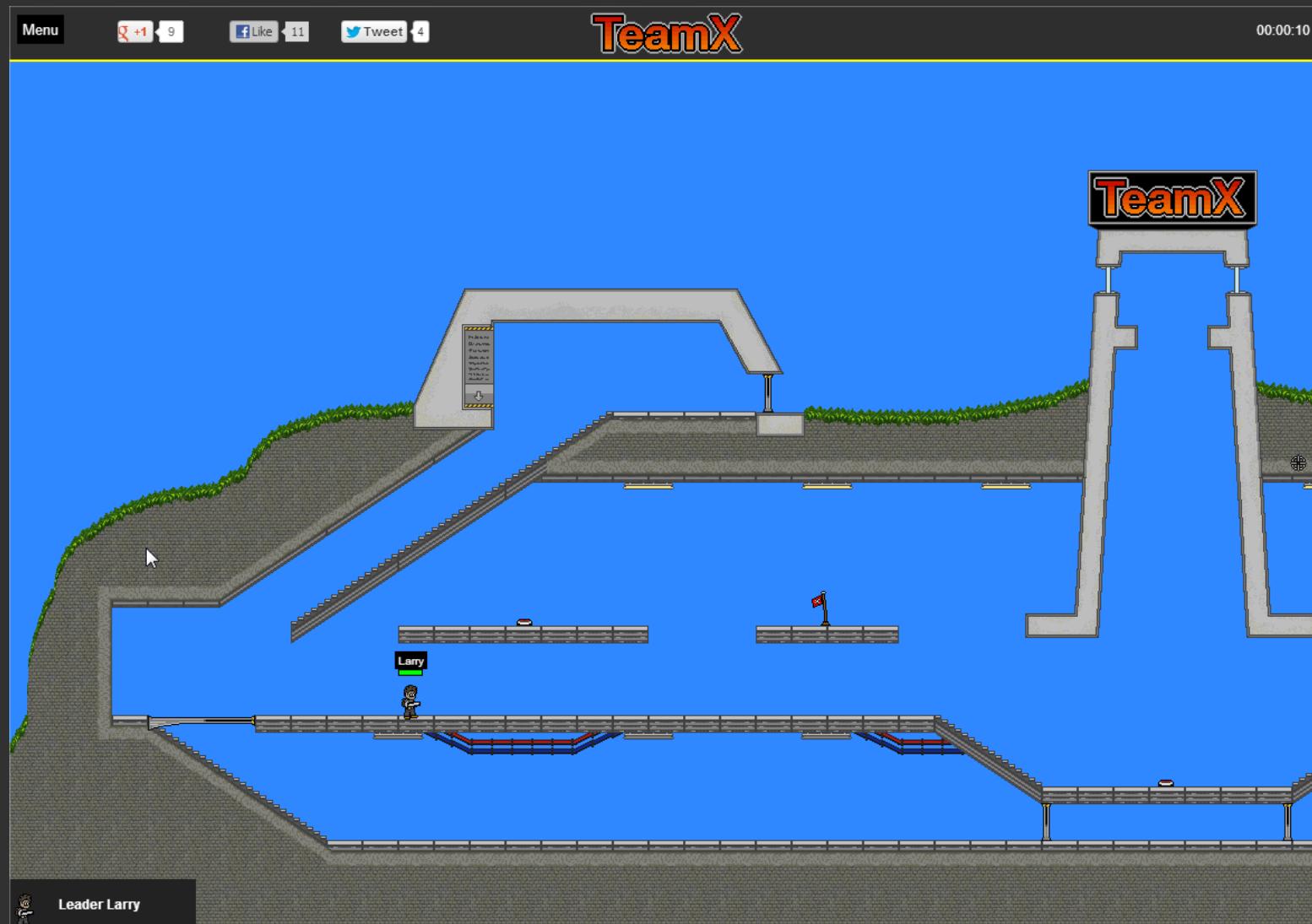
- A dropdown menu set to "Wheel inside".
- A "Fixed radius" slider.
- A "Wheel radius" slider.
- A "Pen radius" slider.
- A "Pen thickness" slider.
- A "Smoker" slider set to "Faster".
- A color palette with a green square selected.
- Buttons for "Start", "Stop", and "Clear".
- An "I'm feeling lucky!" button.

The main canvas displays a geometric diagram consisting of several concentric circles and intersecting lines. A large grey circle is at the center. Inside it, there is a blue circle and a purple circle that intersects the blue one. Two green lines also intersect at the same point where the blue and purple circles meet. The entire diagram is set against a white background with a light grey border around the application window.

# Applications



# Applications



# Applications

Dock Spawn IDE Demo    Pull a panel out from its title bar and dock it elsewhere

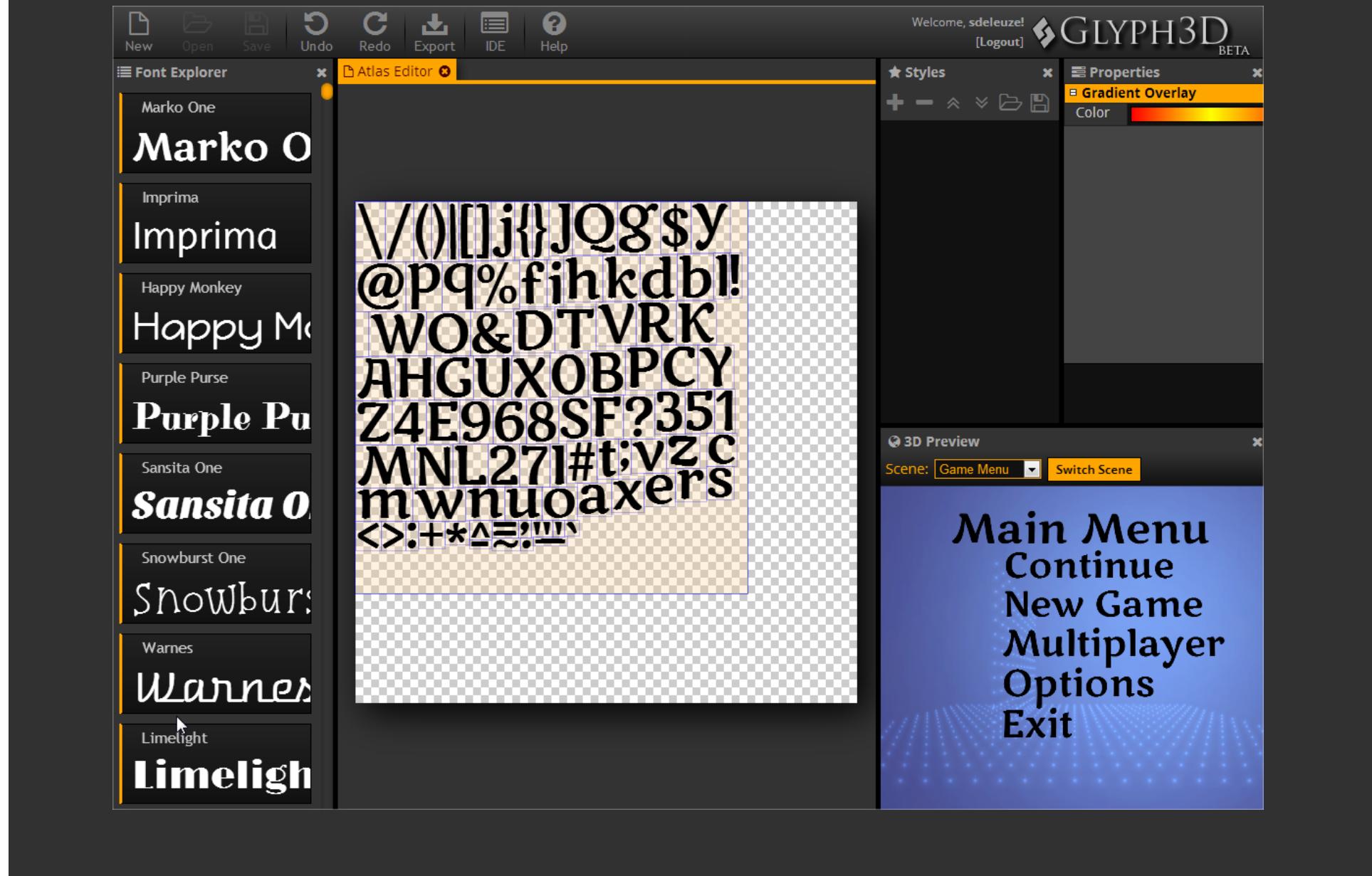
Solution Explorer    Steering.h    Steering.cpp    Toolbox

```
12 syntheticarc::SteeringBehaviours::SteeringBehaviours()
13   : seek(true), bounce(false), timeSinceLastBound(0)
14 {
15 }
16
17 respawn::math::Vector3 syntheticarc::SteeringBehaviours::GetSteeringForce(const GameEntity& h
18   const GameEntity& t
19 {
20   // Get the steering force
21   Vector3 steeringForce = Vector3(0, 0, 0);
22   if (seek) {
23     steeringForce = steeringForce + Seek(host, target);
24   }
25   if (bounce) {
26     steeringForce = direction * host.GetMaxSpeed();
27   }
28   return steeringForce;
29 }
30
31 respawn::math::Vector3 syntheticarc::SteeringBehaviours::Seek( const GameEntity& host, const
32 {
33   Vector3 desired = target.GetPosition() - host.GetPosition();
34
35   // If desired velocity's speed component is greater than maxSpeed then truncate it
36   const float maxSpeed = target.GetMaxSpeed();
37   const float distance = length(desired);
38   if (distance < 0.000001f) {
39     return Vector3(0, 0, 0);
40   }
41   desired = desired * (maxSpeed / distance);
42
43   return desired - host.GetVelocity();
44 }
45
46 bool syntheticarc::SteeringBehaviours::IsSeekEnabled() const
47 {
48   return seek;
49 }
50
51 void syntheticarc::SteeringBehaviours::SetSeekEnabled( bool flag )
52 {
53 }
```

Outline    Properties    Output    Problems

[info] program exited with code 0

# Applications



# Conclusion

Dart a le potentiel pour changer notre façon de développer

Version 1.0 prévue pour cet été

Un concurrent sérieux pour « Javascript as a language », Java, Groovy, Scala, Ruby et Python

Rejoignez la communauté Dart et participez à la création de son écosystème



# Questions / Réponses

Sébastien Deleuze - [@sdeleuze](#)