

ExtJS and Machine Learning

How to deal with cancer using JavaScript and your mobile phone

Dr. Karol Przystalski

About



Overview

2015 - obtained a **Ph.D.** in Computer Science @ Polish Science Academy and Jagiellonian University

2010 until now - CTO @ **Codete**

2007 - 2009 - Software Engineer @ **IBM**

Recent research papers

Multispectral skin patterns analysis using fractal methods}, K. Przystalski and M. J.Ogorzalek. Expert Systems with Applications, 2017

<https://www.sciencedirect.com/science/article/pii/S0957417417304803>

karol@codete.com

0048 608508372

Agenda

1. Where are we on machine learning in JavaScript?
2. Skin cancer
3. JavaScript and machine learning in production
4. Solution architecture
5. Demo
6. Where to go next?

The idea

- We do it since 12 years now
- Help to fight the skin cancer
- Signed partnership contracts with dermatoscopy companies
- Open datasets - ISIC www.isic-archive.com

Where are we on machine learning ...



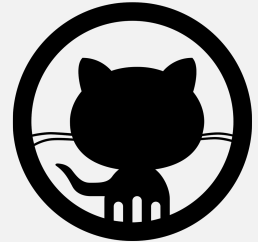
<https://hub.docker.com/r/kprzystalski/jsml/>

Where are we on machine learning ...



<https://hub.docker.com/r/kprzystalski/jsml/>

<https://github.com/codete/js4machinelearning>

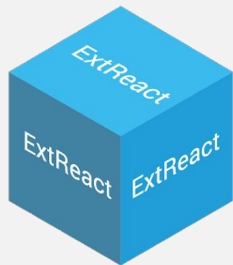


PoC architecture overview

- ✓ ExtReact
- ✓ React is used to manage routing and data flow
- ✓ Ext is used because a lot of UI components that are very well integrated with React.js
- ✓ Phonegap and Cordova
- ✓ Tensorflow.js

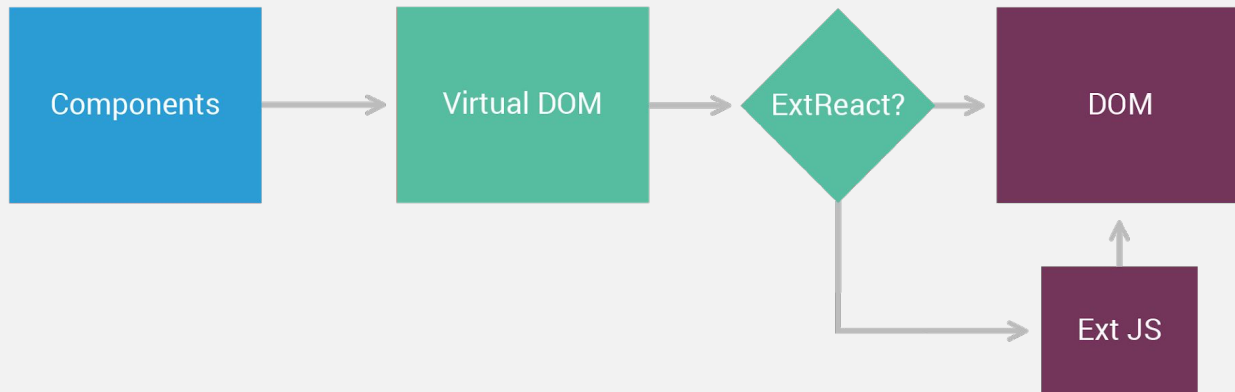
ExtReact flow

Application model



React.js

ExtReact data flow

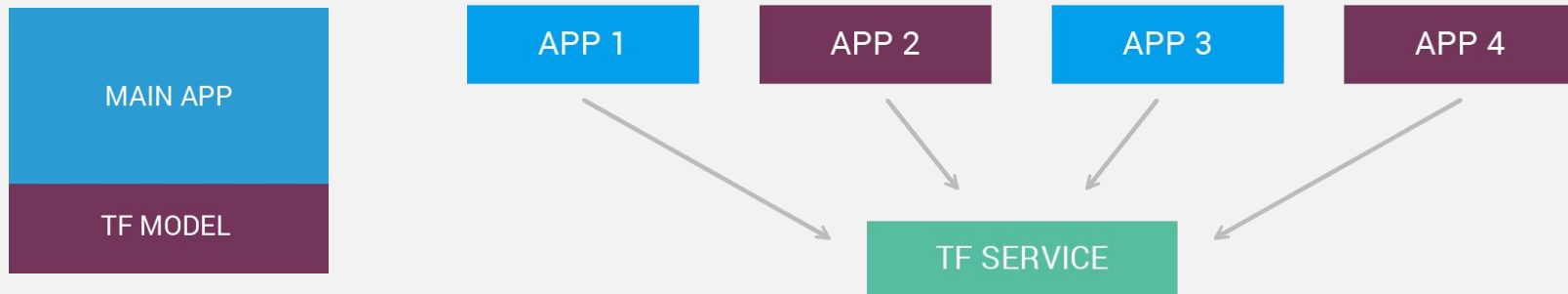


JavaScript vs other languages

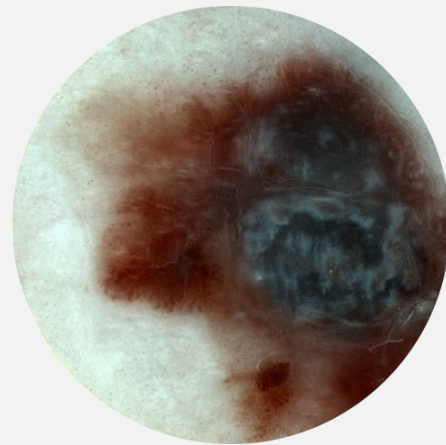
Why and why not JavaScript for ML?

- ✓ JS is usually the second choice for model building. Data scientists prefer Python or R. In Big Data Java and Scala are used too
- ✓ In many cases JS is a good option to load and use a trained model, like a mobile or web app where the pictures or data is taken directly from the browser
- ✓ JS models on the front can be easily copied

In production



Skin cancer



Scoring

There are different scoring methods used by MDs.

- ✓ ABCD
- ✓ 7-point score
- ✓ Hunter score
- ✓ 3-point score
- ✓ and many other scoring methods

There are about 30 different patterns that are specific for melanoma.

Skin cancer

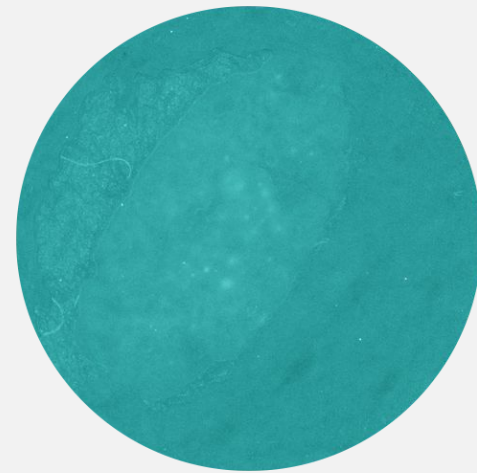
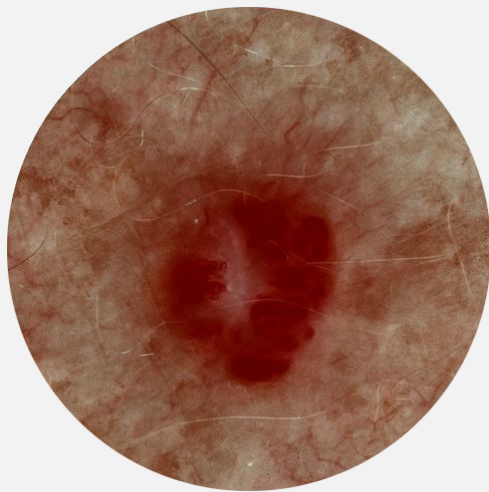
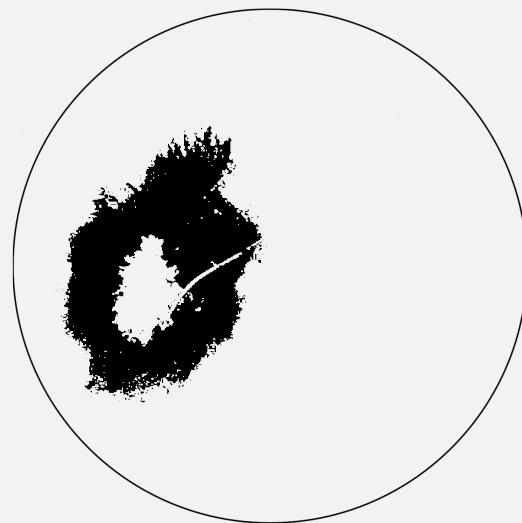
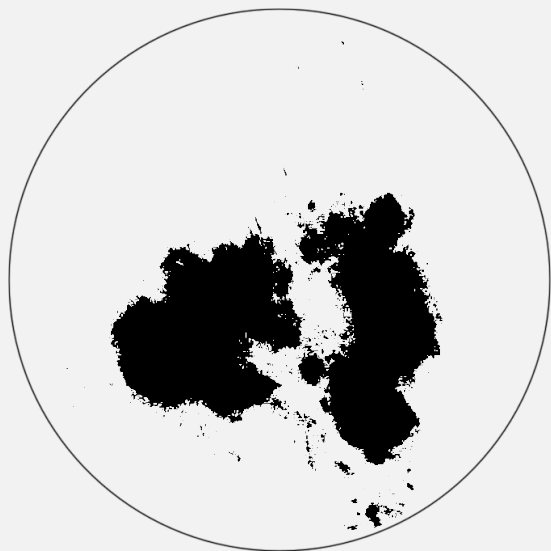
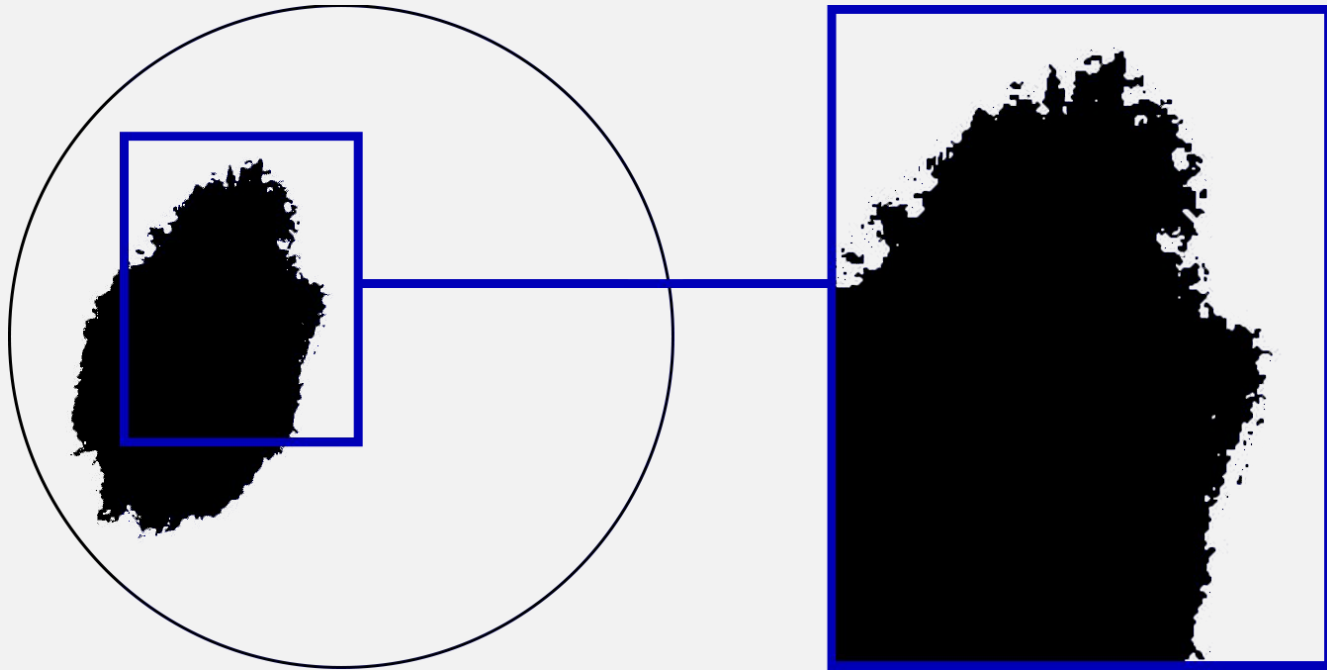


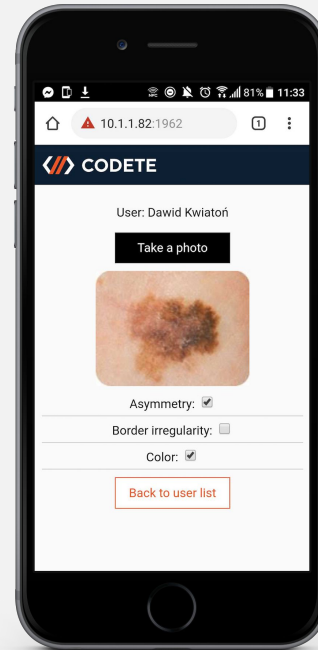
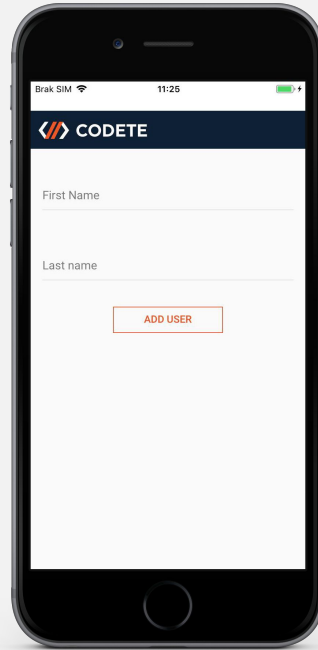
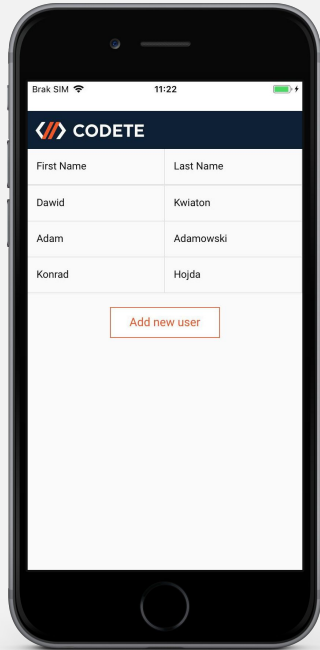
Image processing



Skin cancer



Demo



Summary

Pros

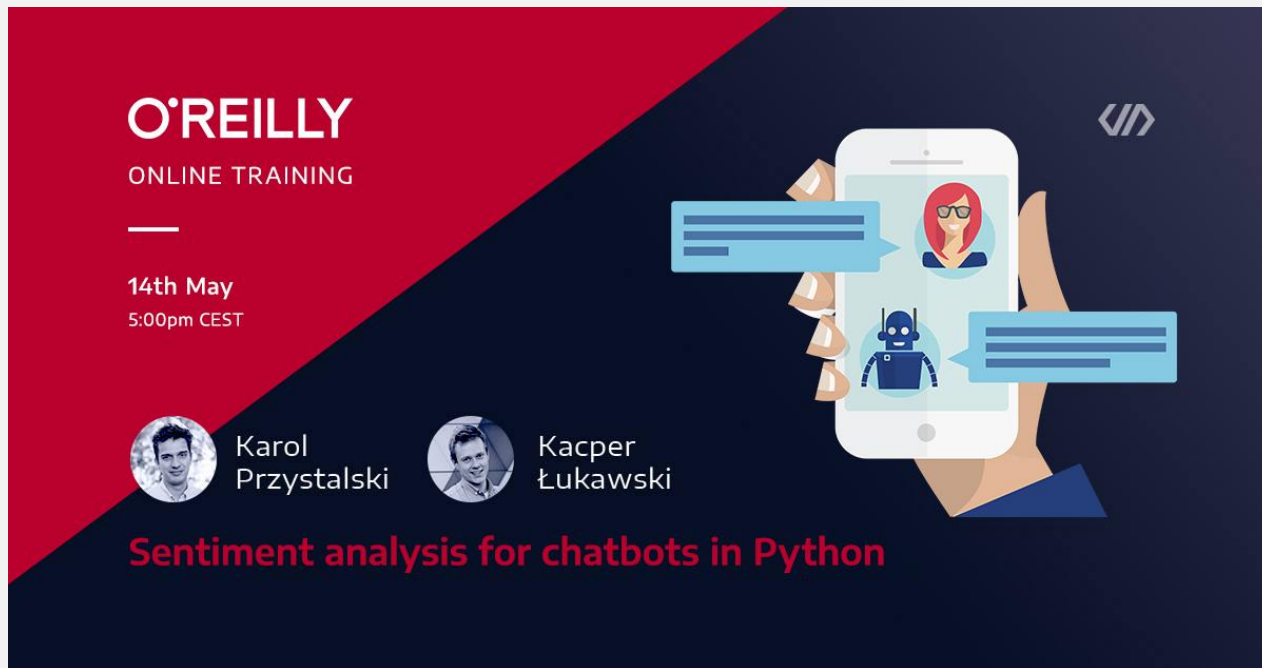
- ✓ Can be easily used for prototyping
- ✓ Support in case something goes wrong
- ✓ Works on different mobile phones
- ✓ Can be easily moved to a web app

Summary

Cons



- ✓ Not so many books like Ext JS 6 By Example
<http://shop.oreilly.com/product/9781783550494.do>
- ✓ High memory usage
- ✓ Ext architecture can be difficult to learn by developers who does not know it

Where to go next?



O'REILLY
ONLINE TRAINING

14th May
5:00pm CEST

 Karol Przystalski  Kacper Łukawski


Sentiment analysis for chatbots in Python

Where to go next?



O'REILLY
ONLINE TRAINING

7th May
5:00pm CEST

 Karol Przystalski

Building intelligent bots in Python

The banner features a dark blue background with a red diagonal stripe on the left. On the right, there is an illustration of a hand holding a white smartphone. The phone screen shows a chat interface with a red-haired woman's profile and a blue robot icon. Two blue speech bubbles are visible, one on each side of the phone. In the top right corner of the banner, there is a small white icon consisting of two slanted parallel lines.

Where to go next?



O'REILLY
ONLINE TRAINING

May 9th
4:00pm CET



Karol
Przystalwski

Introduction to Distributed Ledger Technology for Enterprise

The banner features a dark blue background with a red diagonal stripe on the left. On the right, there is a network diagram consisting of ten blue cubes connected by dashed lines, with a small white logo in the top right corner.



Q&A