

Computer Vision

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Bio

Assistant Professor at Warsaw University of Technology



Visiting Scholar at Stanford University and NTU (*planned*)



**NANYANG
TECHNOLOGICAL
UNIVERSITY**
SINGAPORE

PhD in Computer Vision and Machine Learning from EPFL



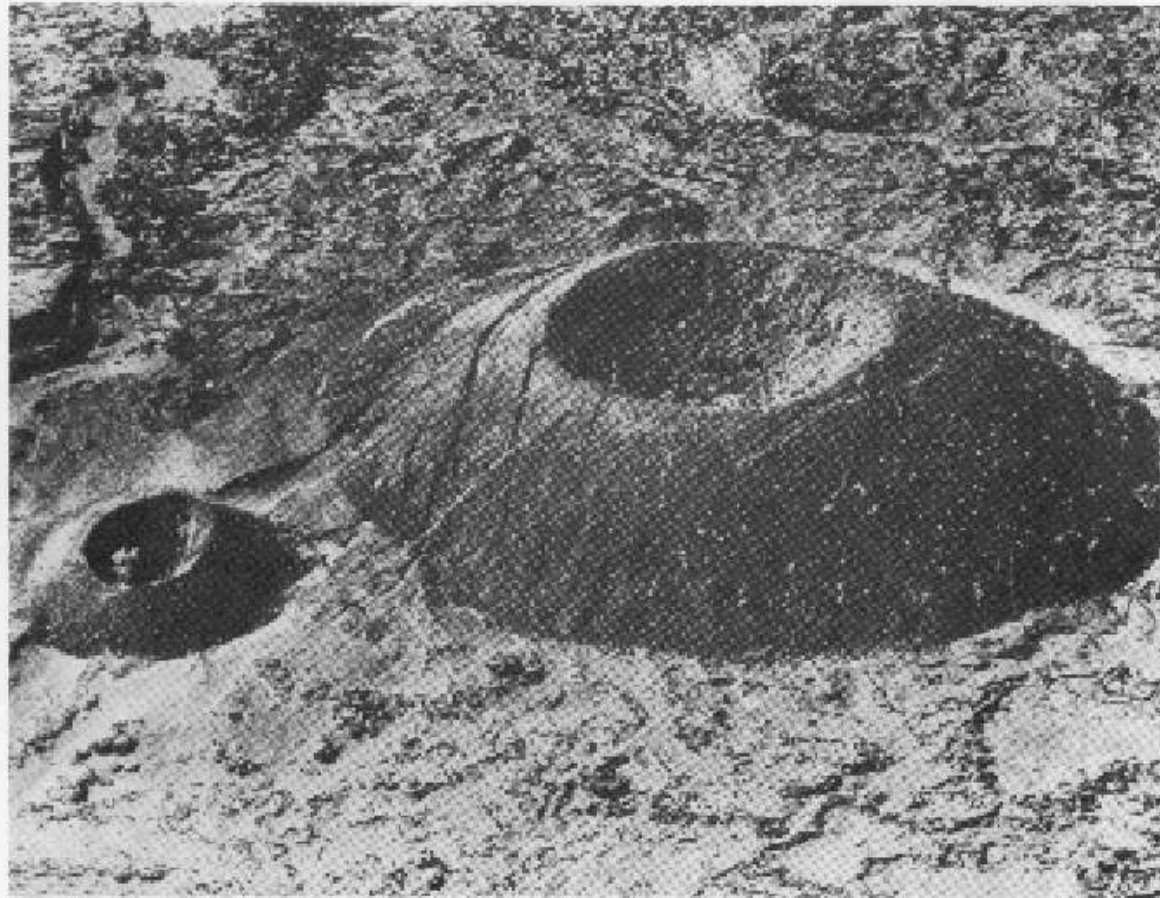
Internships at Google, Qualcomm and Telefonica



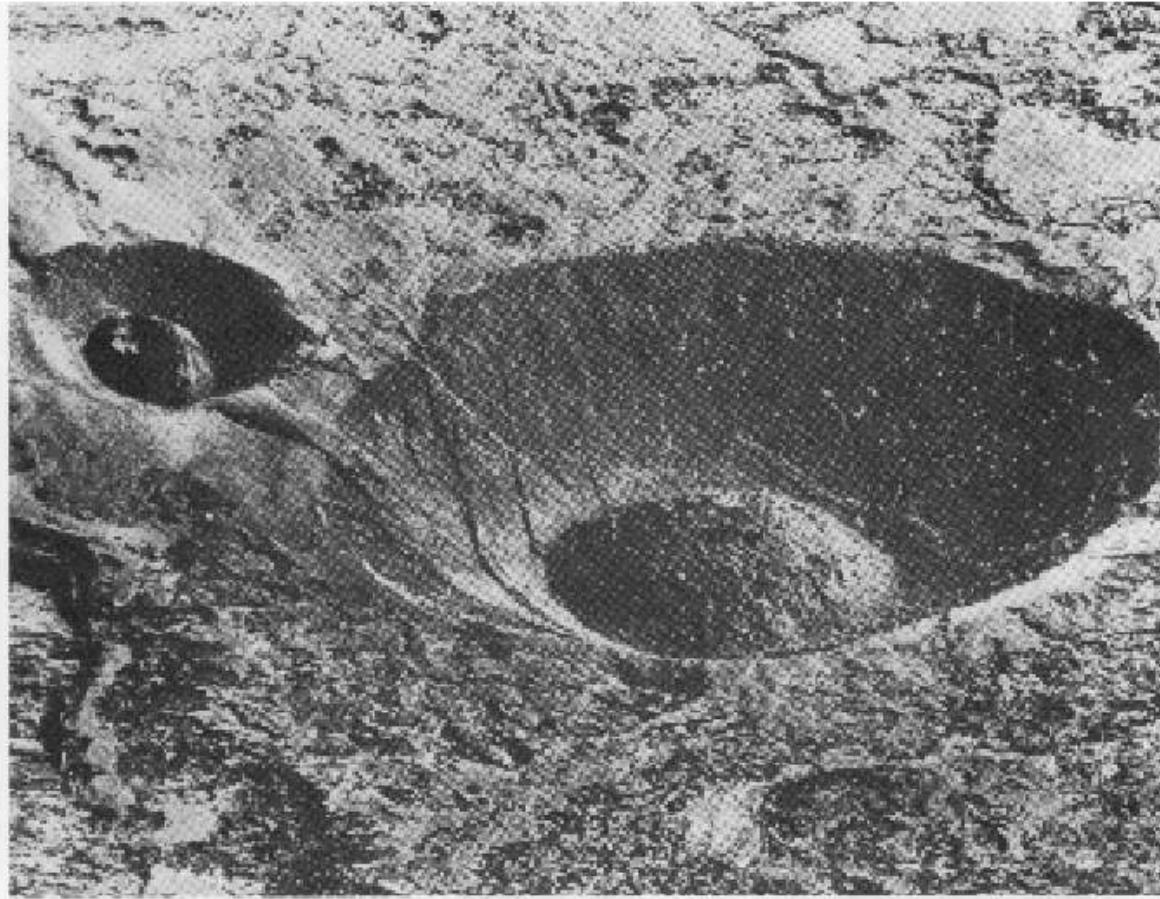
Chief Scientist and Partner at Tooploox



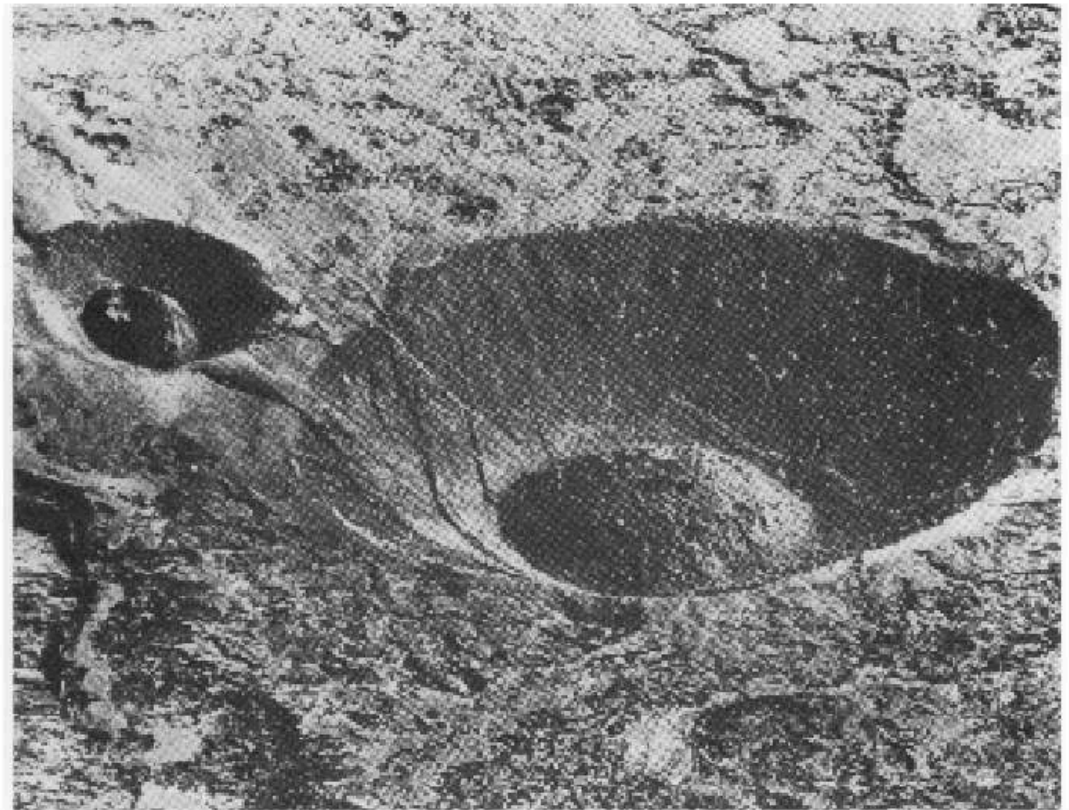
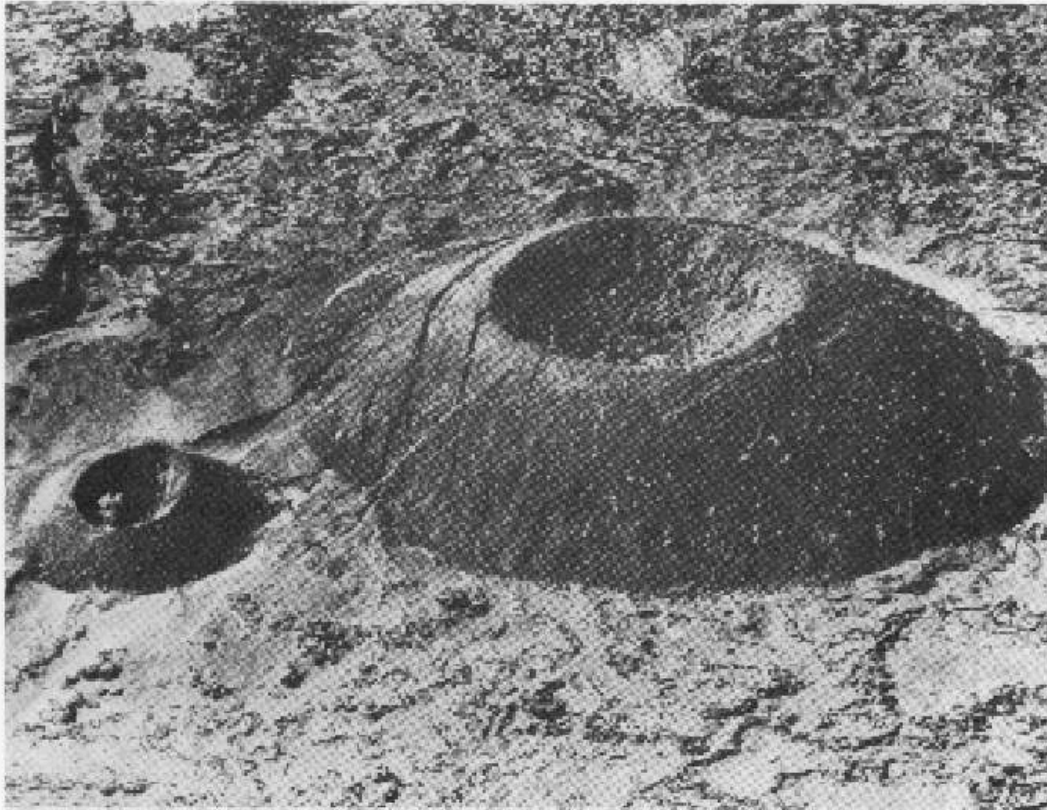
Computer Vision



Computer Vision



Where is the sun?



How it started

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
PROJECT MAC

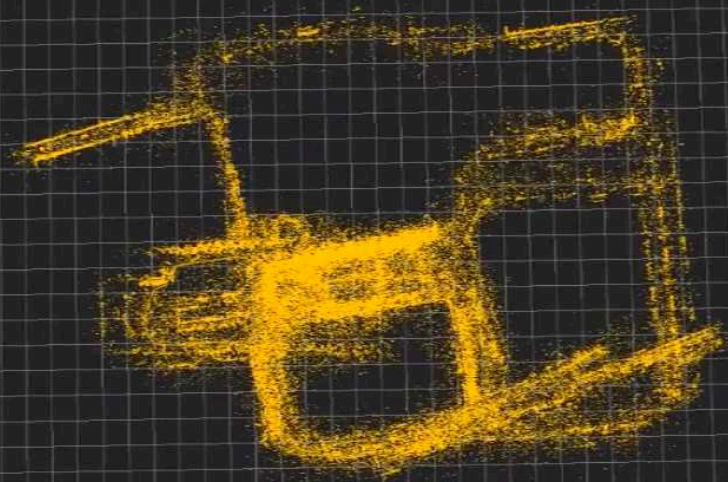
Artificial Intelligence Group
Vision Memo. No. 100.

July 7, 1966

THE SUMMER VISION PROJECT

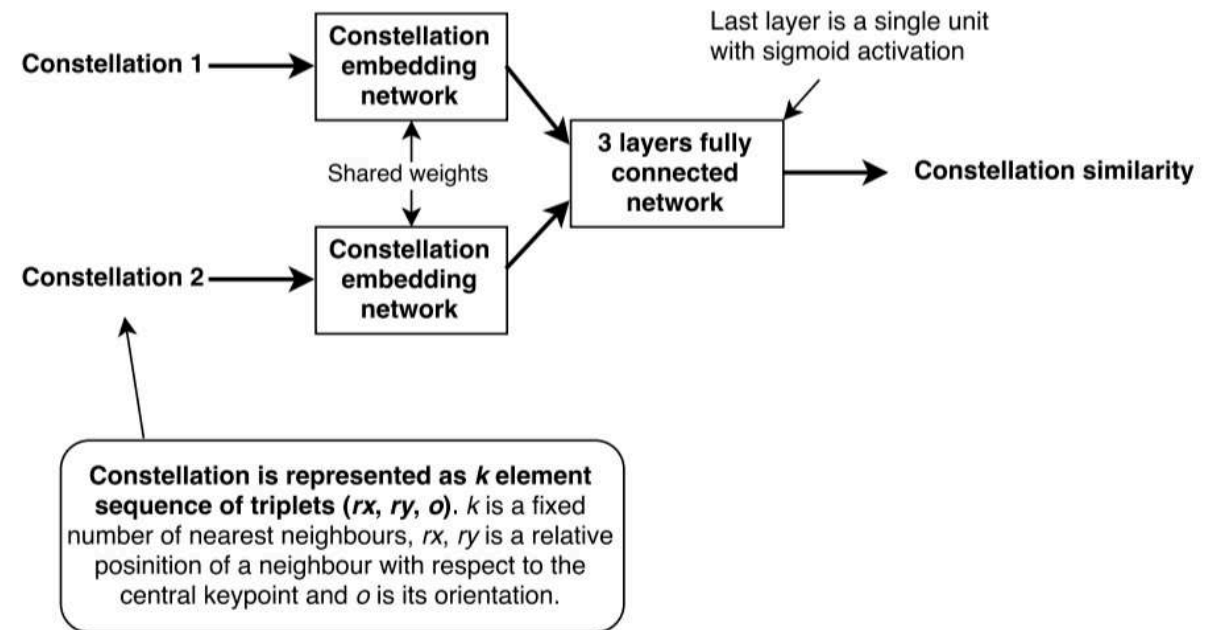
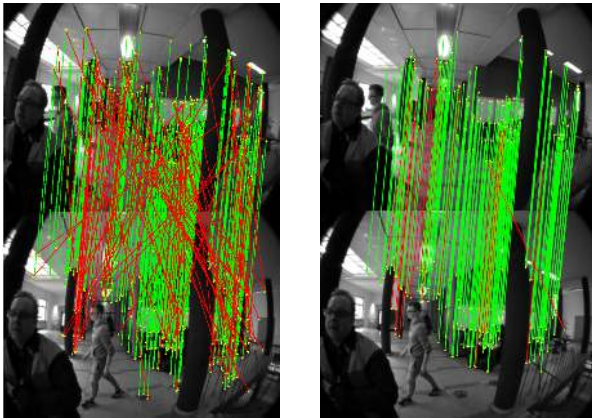
Seymour Papert

The summer vision project is an attempt to use our summer workers effectively in the construction of a significant part of a visual system. The particular task was chosen partly because it can be segmented into sub-problems which will allow individuals to work independently and yet participate in the construction of a system complex enough to be a real landmark in the development of "pattern recognition".



Google GeoAR/ARcore

- **Siamese neural networks** that learn similarities between keypoint constellations in images



SConE

Siamese Constellation Embedding

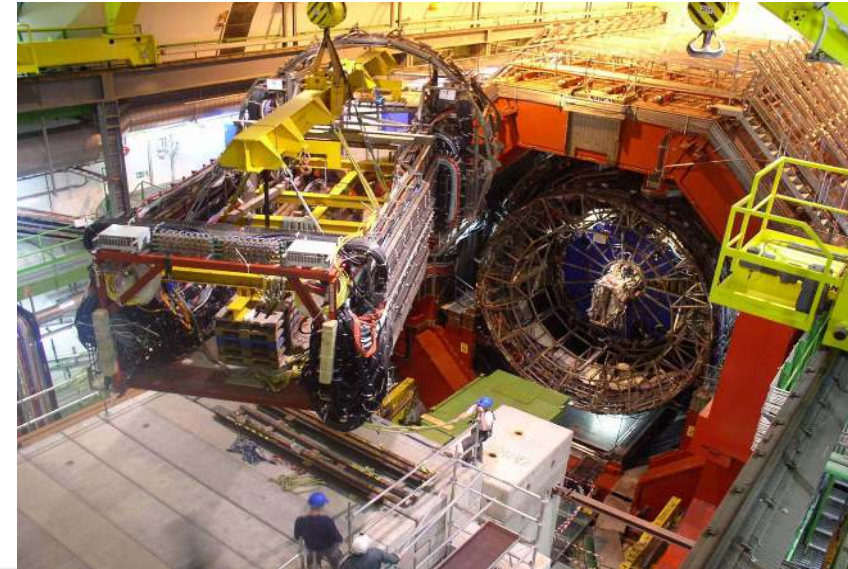
ECCV 2018

Submission ID 1735

Collaboration with CERN

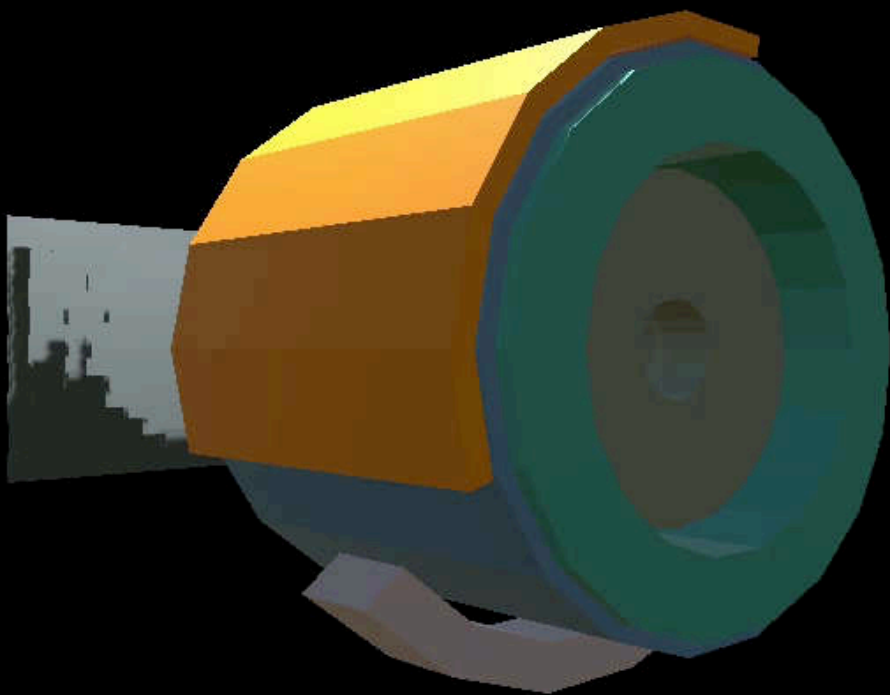
Data Quality Assurance in the ALICE experiment in LHC at CERN

- Machine learning for **particle identity detection (PID)**
- Anomaly detection with **Generative Adversarial Networks**
- Fast detector **response simulation**



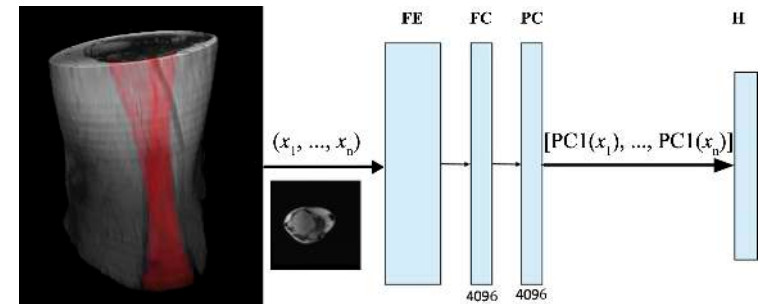
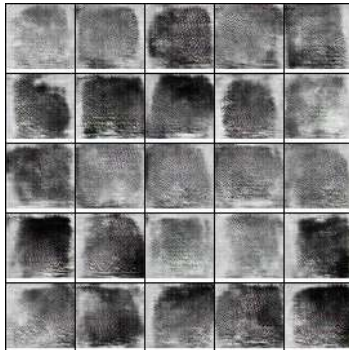
Using Random Forest Classifier for particle identification in the ALICE Experiment, Trzcinski et al., ITSRC'18

Generative Models for Fast Cluster Simulations in the TPC for the ALICE Experiment, Deja et al., ITSRC'18



Medical imaging analysis

- **Preterm birth prediction** for ultrasound images
- **Generative adversarial** approach for data **privacy** enforcement
- **Achilles tendon healing** monitoring with neural networks



Siamese Generative Adversarial Privatizer for Biometric Data, Oleszkiewicz et al. ACCV'18

Estimating Achilles tendon healing progress with convolutional neural networks, Kapiński et al. MICCAI'18

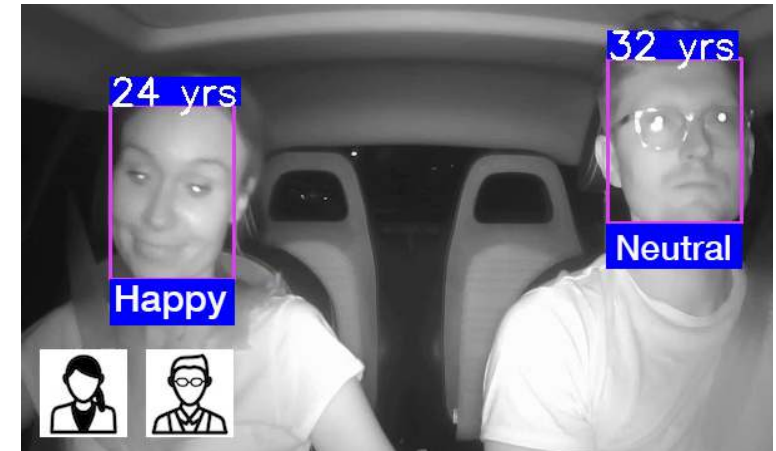
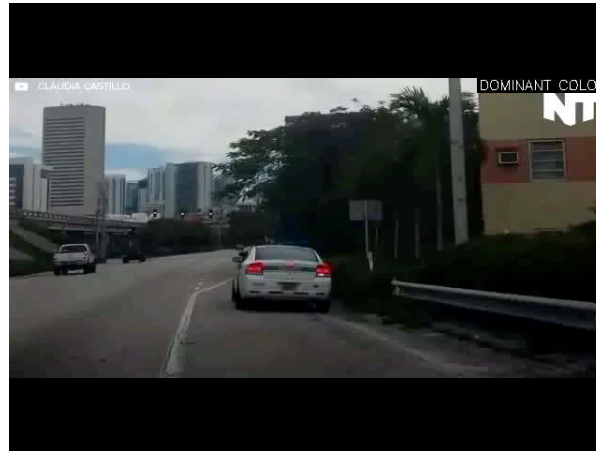
Subjective attribute estimation

- Video popularity prediction
- Emotion recognition
- Stylistic similarity



Score: 0.94305

This could easily be the happiest dog in the world...



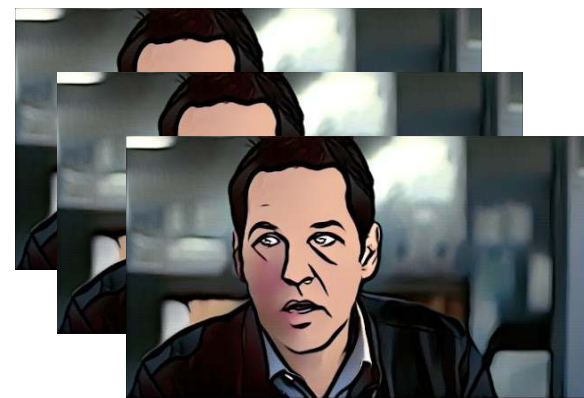
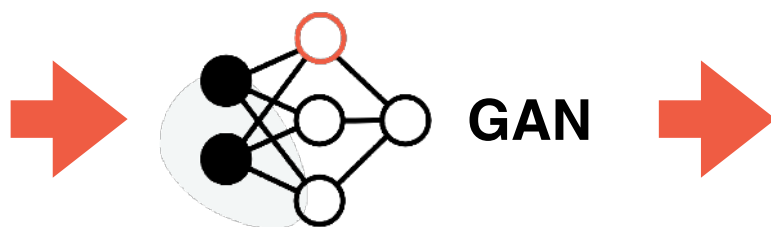
COMIXIFY.ai

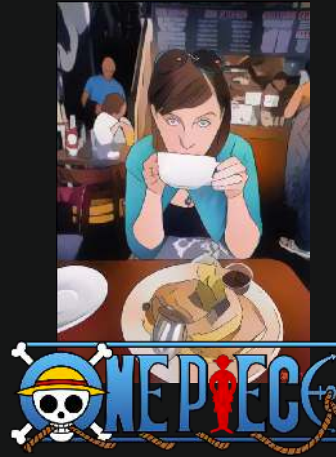


AI-powered frame selection & comics style

*Comixify: Transform video into a comics, Pęsko et al.,
Fundamenta Informaticae'19*







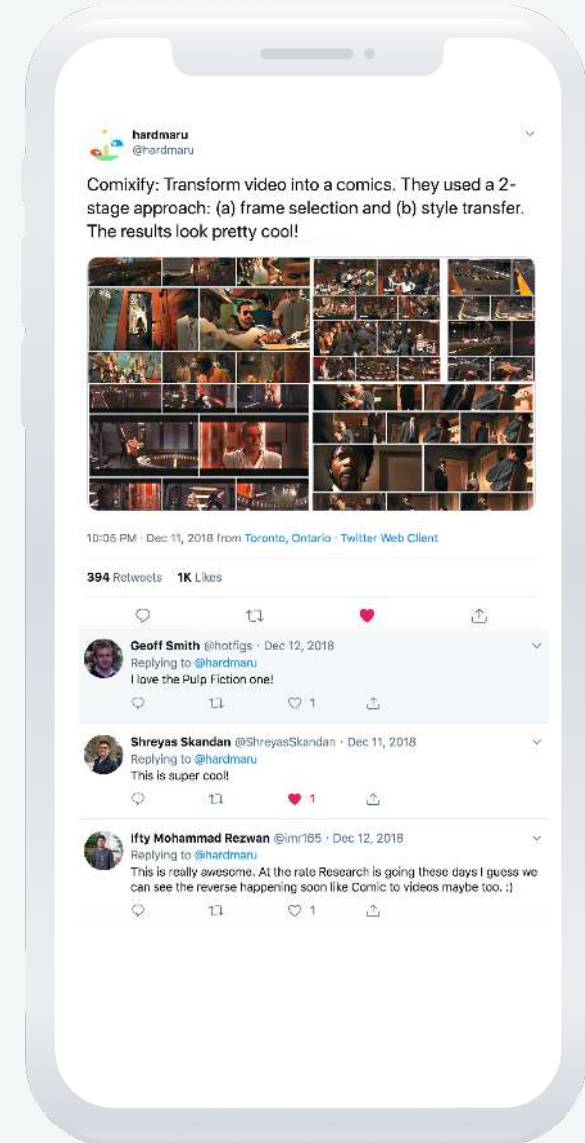
150 000 user visits
50 000 comic strips

engadget

MIT
Technology
Review

HUFFPOST

CBINSIGHTS









Summary

Visual geolocalization (Google ARCore collaboration)

Machine learning for physics (CERN collaboration)

Medical imaging analysis with deep learning

Subjective attribute estimation (Sotrender collaboration)

Comixify: turning videos into comics

Team

Prof. P. Rokita (*Head*)

Post docs

Jacek Komorowski

Łukasz Dąbała

PhD students

Grzegorz Kurzejamski

*Kamil Deja**

*Tomasz Włodarczyk**

Grad students

Paweł Andruszkiewicz

Maciej Pęsko

Szymon Płotka

Undergrad students

Adam Svystun

Karolina Pawluk

other diplomants



Supported by:



Funded by:



** supervised by Prof. P. Rokita*

Thank you

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