A M
L D

January 28

AI & Cities

Connect

www.appliedmldays.org
@appliedmldays
#AMLD2019

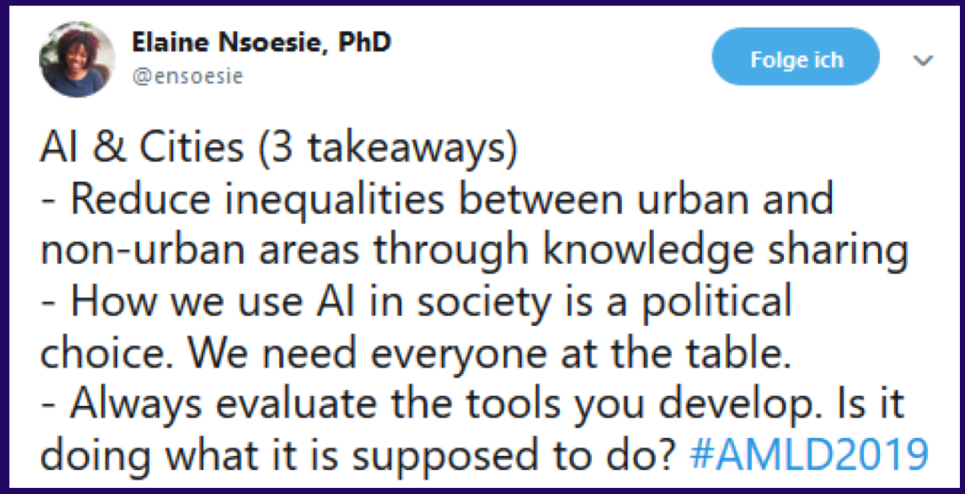
AI & Cities: Panel Discussion

Panelists:

Valentine Goddard (AI Impact Alliance)
Stephen Goldsmith (Harvard Kennedy School)
Alex “Sandy” Pentland (MIT Media Lab)

Main talking points:

_ Citizen participation in AI implementation
_ Finding the right metrics of “public value”
_ AI can be both harm- and helpful
_ AI doesn’t generalize well (yet) in complex urban environments

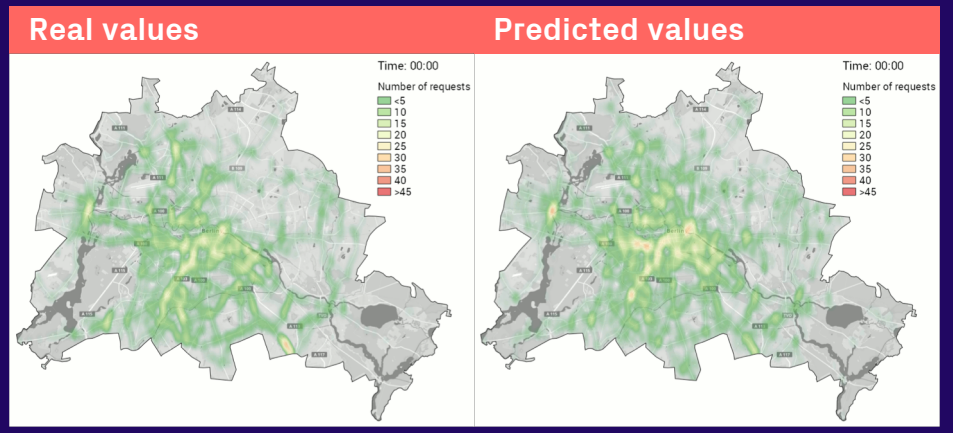


AI & Cities: Spotlight talks

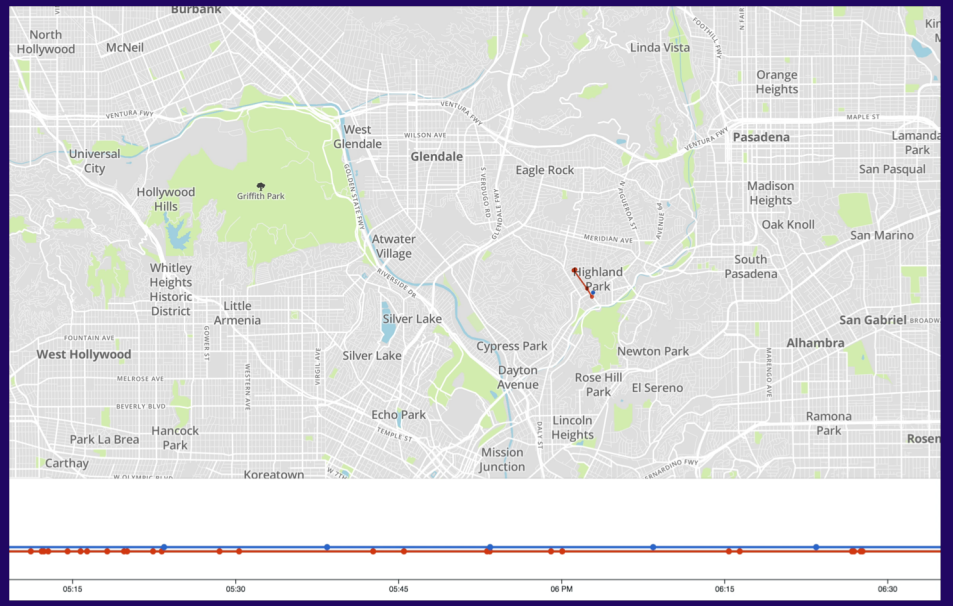
Speakers:

Cristina Kadar (ETHZ), Daniel Gatica-Perez (EPFL), Sandy Pentland (MIT), Piotr Mirowski (DeepMind), Christopher Nowzohour (Teralytics), Niklas Goby (Geospin), Mohamed Kafsi (Swisscom)

© DeepMind



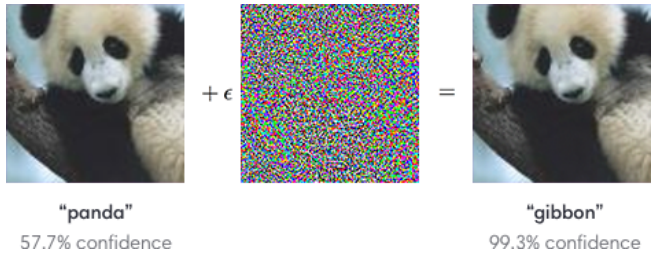
© Geospin



© Teralytics

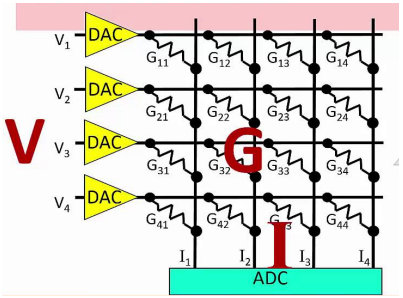
AI & Computer Systems

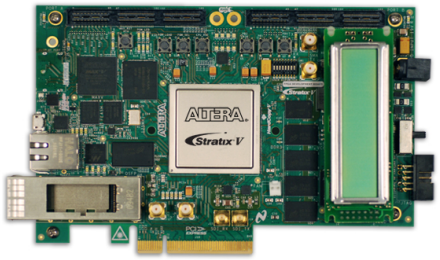
ecocloud
an EPFL research center



The present:

- Building ML microservices for IoT
- Building libraries to identify and mitigate adversarial attacks





The future:

- Using FPGAs to accelerate ML
- Taking advantage of numeric properties of models to accelerate them
- Beyond digital ML: analog accelerators

AI & Computer Systems

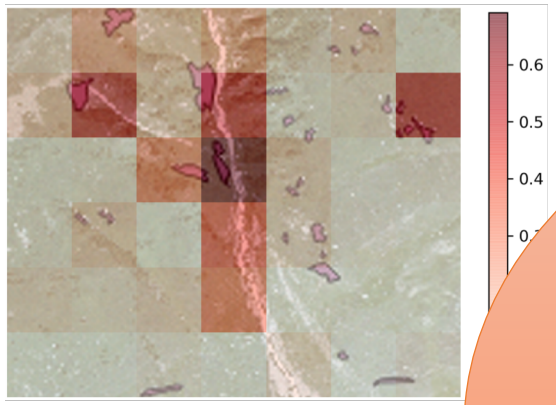
ecocloud
an EPFL research center

Thanks to our speakers:

- Andreas Moshovos
- Michael Papamichael
- Hadi Esmaeilzadeh
- Kevin Smeyers
- Svetlana Levitan

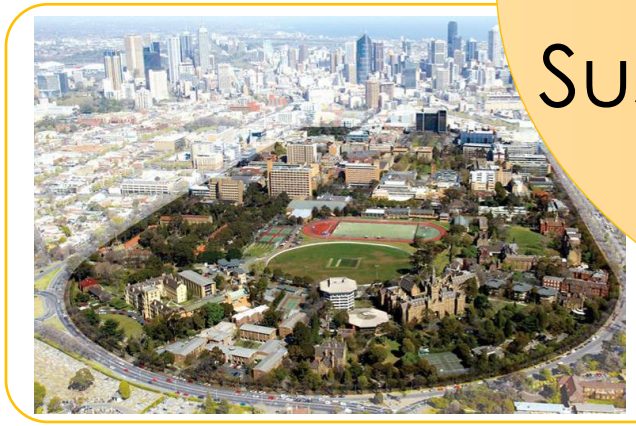
Thanks to our audience!

AI & Environment



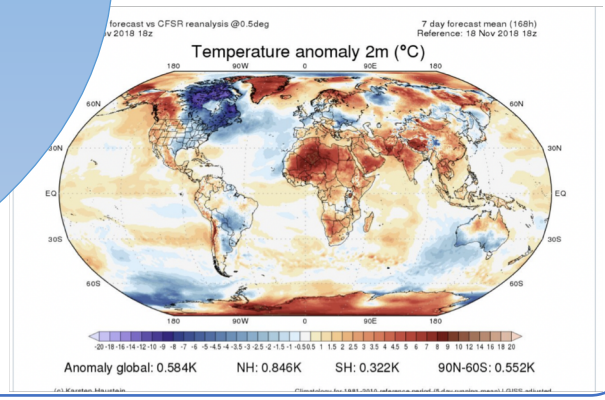
Remote Sensing

Biodiversity



Sustainability & Energy

Climate



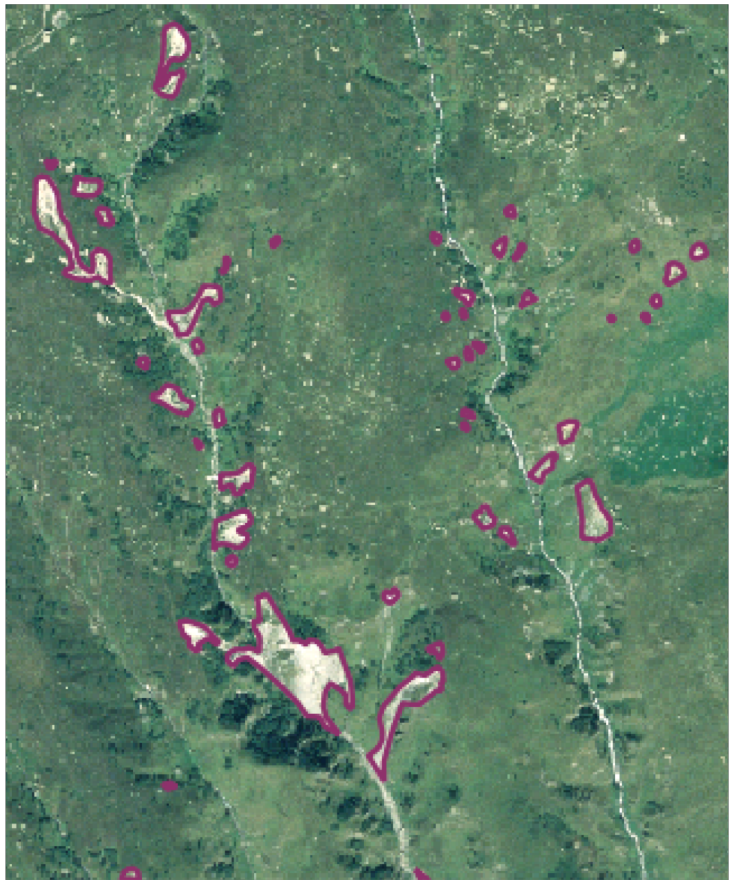
Organizers: A. Walch, R. Castello, J. Wegner, M. Kanevski, N. Mohajeri, F. de Morsier

Remote Sensing & Biodiversity

- Prediction of *crop yields*, *landslides* or *land use*
- Modelling of *species migration*

Challenges:

- Biased observations (no equal coverage)
- Lack of labelled training data
- Interpretability of models



Invited speakers: M. Volpi, V. Demyanov, W. Jetz, G. van Horn

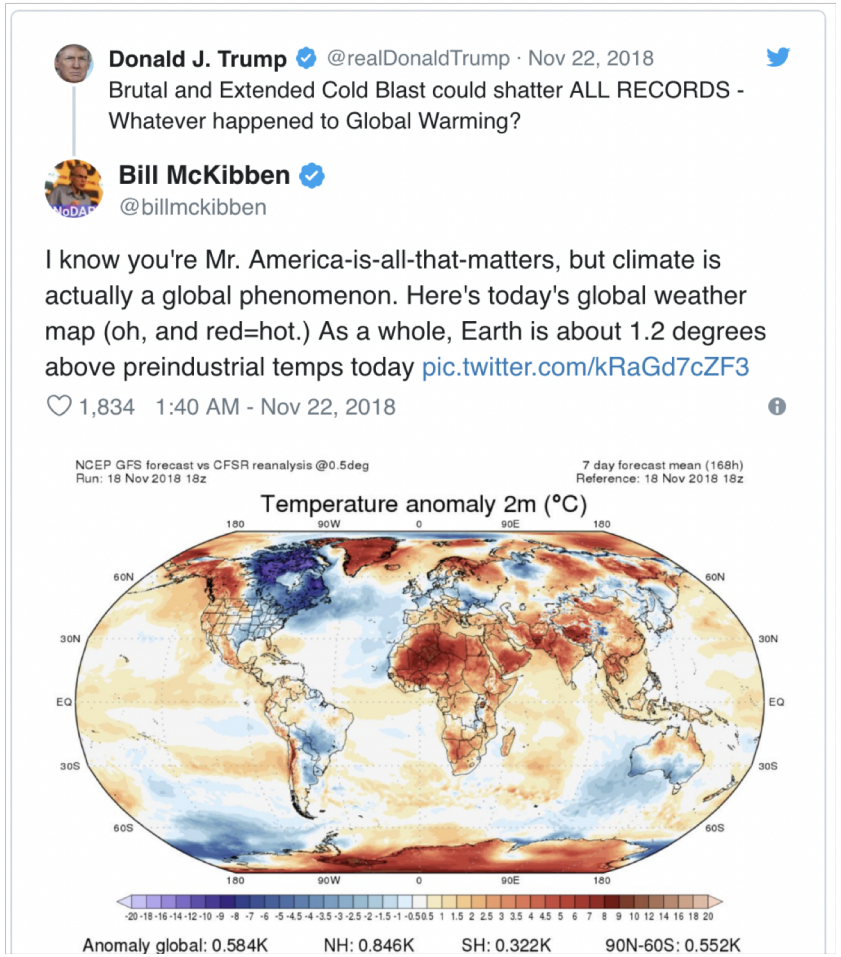
Energy & Climate

- Modelling of *energy use & resources*
- Improvement of *climate models*

Challenges

- Integrate ML with existing models
- Understand patterns in the data
- ML to "*build bridges*"

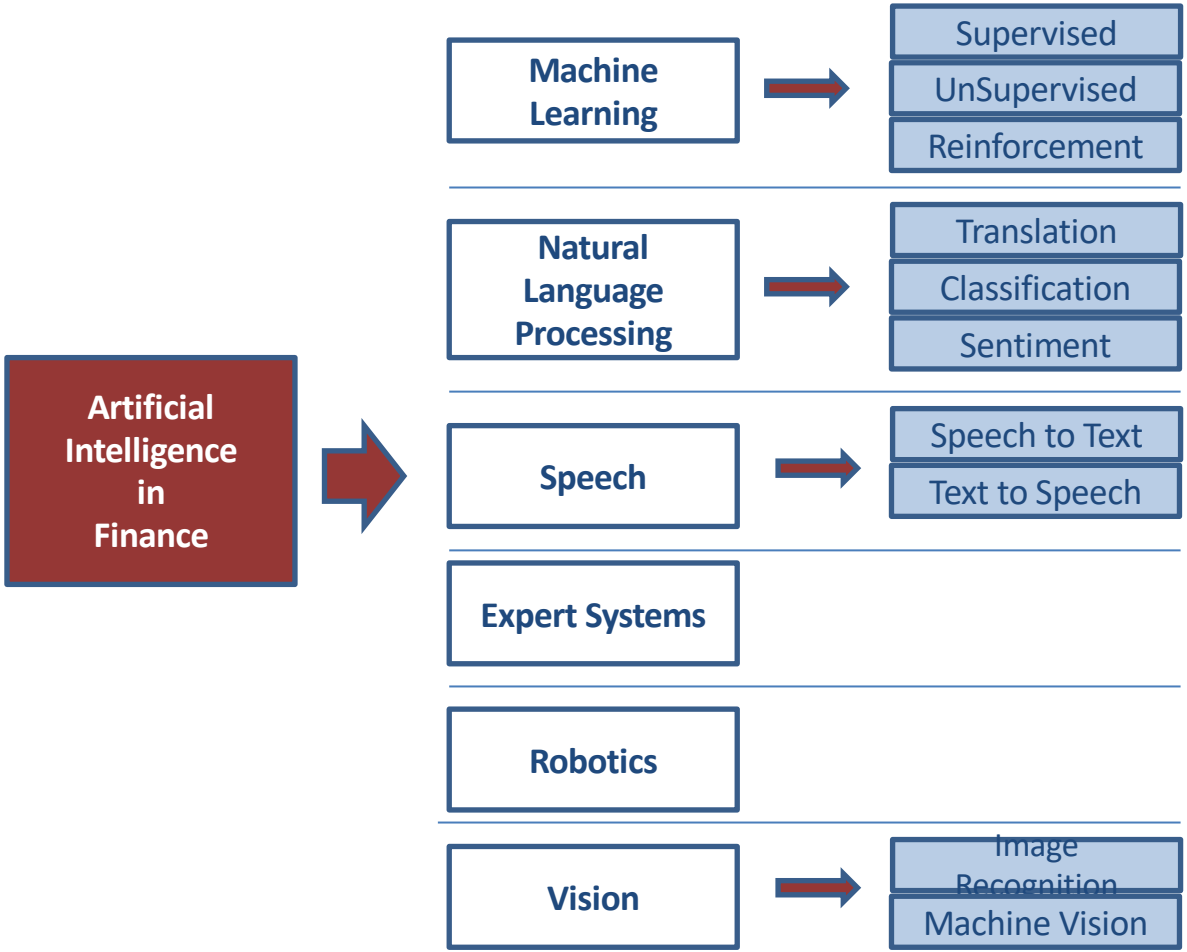
Invited speakers: M. Kanevski, S. Halgamuge, A. Berne, S. Sippel



Artificial Intelligence in Finance

Lausanne

Miquel Noguer i Alonso PhD


Artificial Intelligence in Finance
Machine Learning
Supervised
UnSupervised
Reinforcement
Natural Language Processing
Translation
Classification
Sentiment
Speech
Speech to Text
Text to Speech
Expert Systems
Robotics
Vision
Image Recognition
Machine Vision

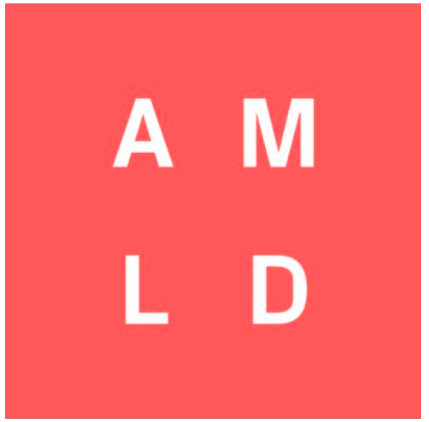
Artificial Intelligence in Finance - Open Issues

Big Data	• Data sparse, scale, noisy, not well defined • Data Privacy
Learning From Experience	• Multiple agent, instruction , sparse rewards • Variability and dynamics in regime, markets, client
Explainability & Interpretability	• Transparency for clients and regulators • Usability of models in business processes
Values – Ethics , Fairness	• Regulatory standards for creating suitable products • Required : non discriminatory ,non biased

Artificial Intelligence in Finance

Lausanne

Miquel Noguer i Alonso PhD



AI and Health

Marcel Salathé and Sunil Mallya

Emerging Themes

- Good to see Doctors collaborating with Machine Learning practitioners. The room had 3 clinicians but >75% of the attendees had collaborated with clinicians.
- Interpretability is extremely important for large scale adoption
- The ML community needs to collaborate with regulators if they are to empower consumers in the near future
- ML can help in intervention and recovery – boosting language rehabilitation training after stroke with Brain-Computer-Inference
- ML can help in clinical trial design and target participants

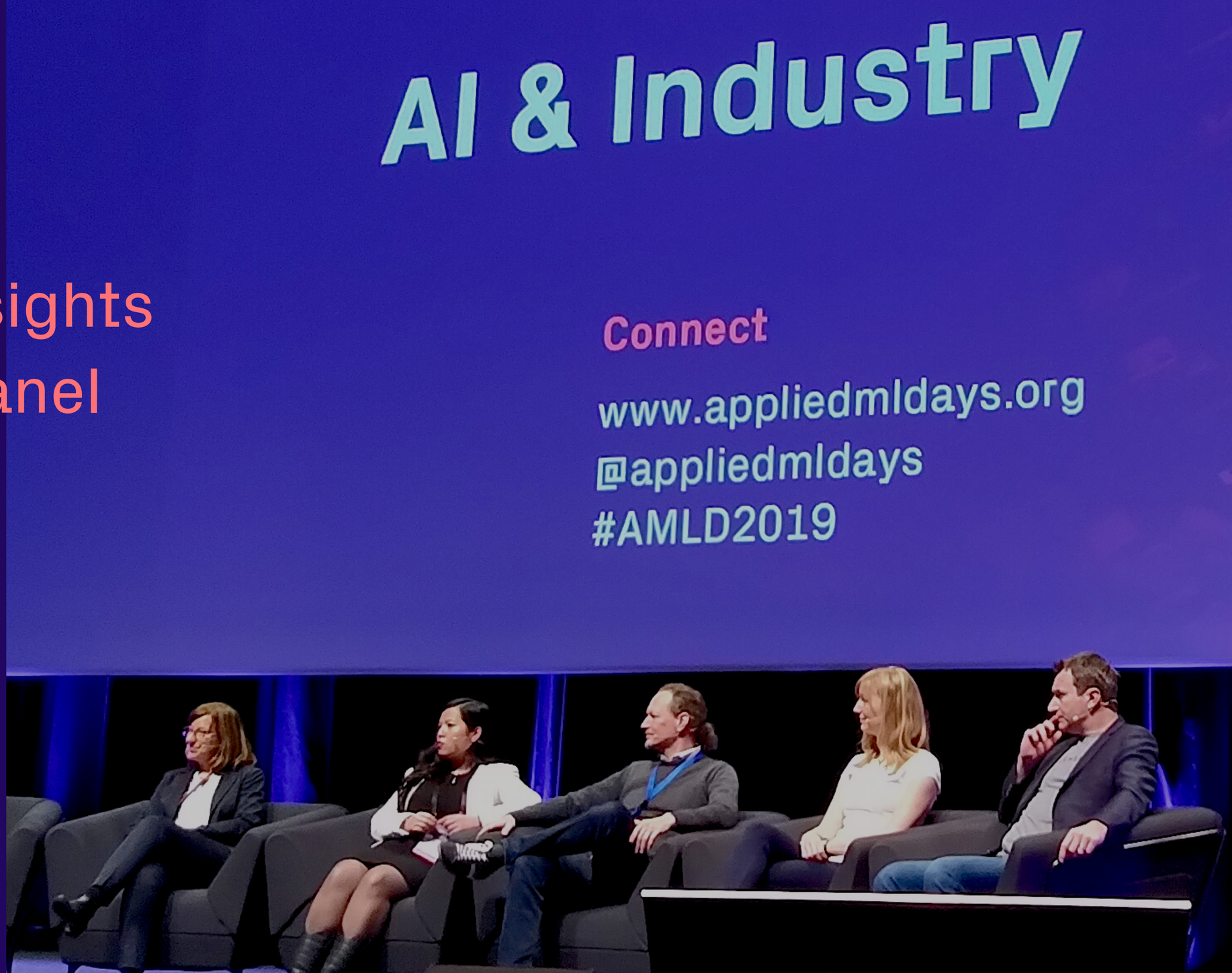
Medical Imaging, Health Records and Population Health

- Medical Imaging
  - Stock CNN architectures with pretrained imagenet weights can go a long way
- Electronic Health Records and Clinical Notes
  - Medical note data is rich, CNNs and RNNs can get much better results than bag of words or tf-idf based for medical diagnosis
  - RNNs are effective at modeling longitudinal data for disease onset
- Population Health
  - Location data and search history to food poisoning; Epidemic prediction
  - Location data, Pop health data and satellite imaging to identify neighborhood with high obesity risk

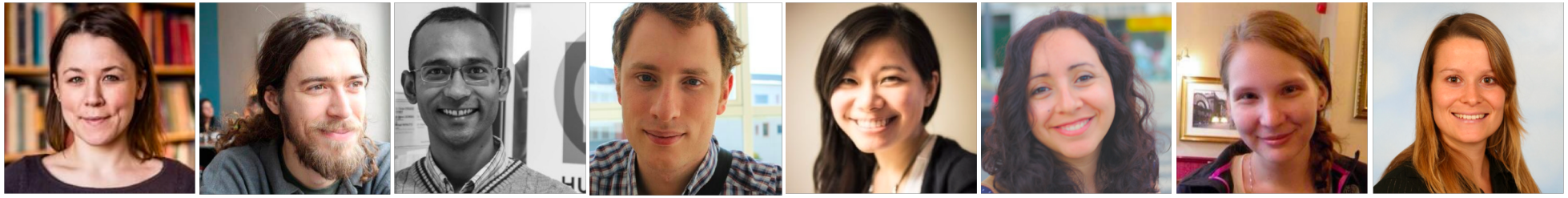
AI & Industry

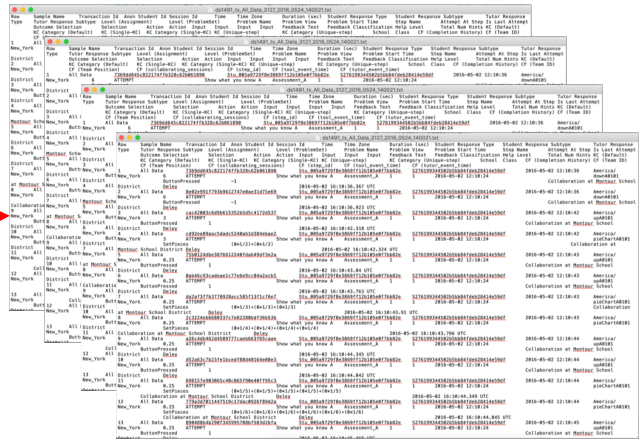
Swiss Re
Swisscom
Buhler
IBM
Nvidia
Google
Facebook
MLLab.ai
Dathena Science
Firmenich
ambrite
Nabla
Ecorobotix
Finity AI
Iprova
Common Ground
ELCA
Neural Concept
Atos
EPFL EXTS
Swisscom
Privately
Picterra
Gamaya
Element.ai
Acceleris
GF
Empa
BearingPoint
crowdAI
GaitUP
Vontobel

Startup Insights
Industry Panel

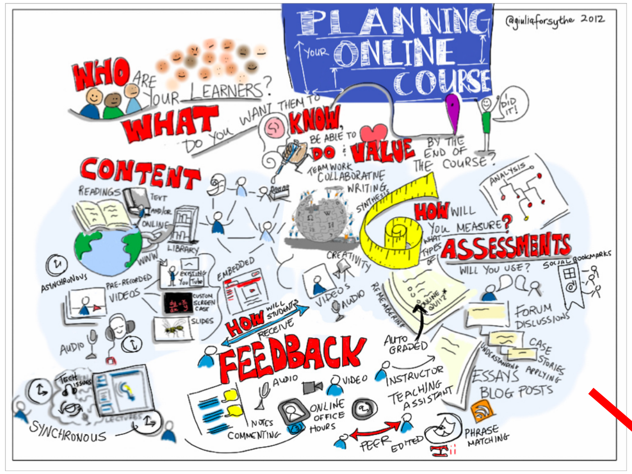


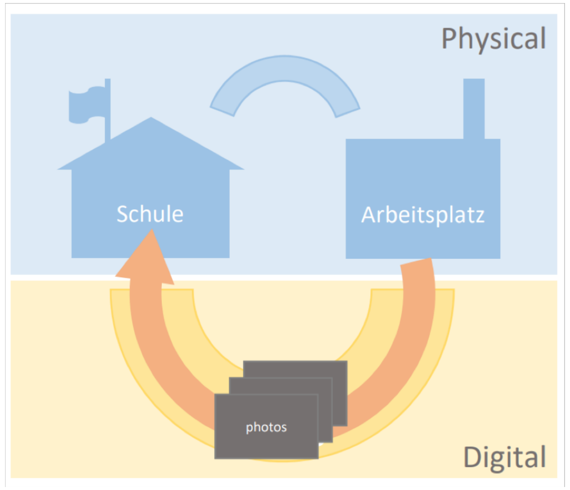
AI & Learning Analytics Track

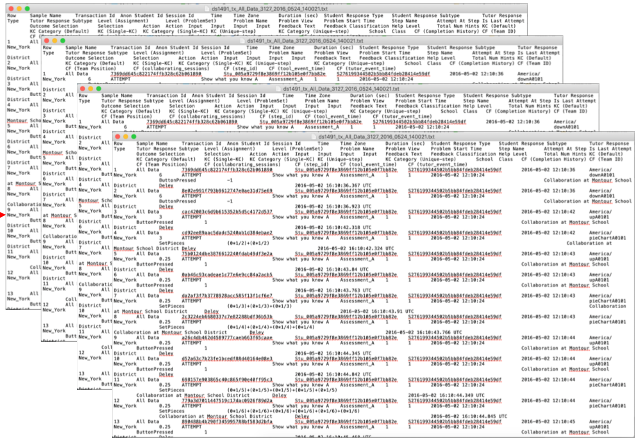


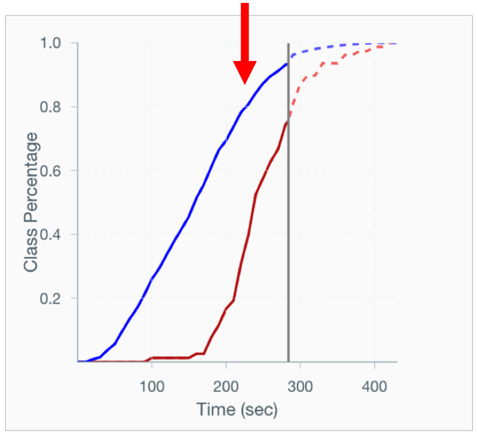


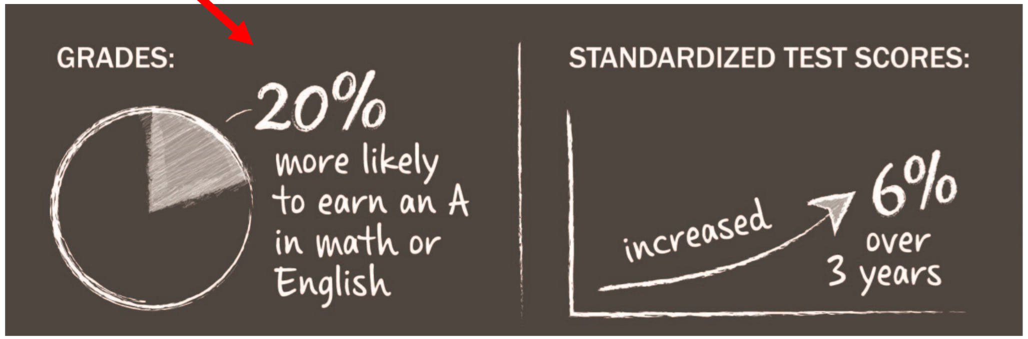
Organizers: Pierre Dillenbourg, Jennifer Olsen, Wafa Johal, Catharine Oertel


PLANNING YOUR ONLINE COURSE
@giuliaforsythe 2012
WHO ARE YOUR LEARNERS?
WHAT DO YOU WANT THEM TO KNOW
BE ABLE TO DO
VALUE BY THE END OF THE COURSE?
CONTENT
HOW WILL YOU MEASURE?
ASSESSMENTS
HOW WILL STUDENTS RECEIVE FEEDBACK
SYNCHRONOUS


Physical
Schule
Arbeitsplatz
photos
Digital




1.0
0.8
0.6
0.4
0.2
Class Percentage
100
200
300
400
Time (sec)


GRADES:
20%
more likely
to earn an A
in math or
English
STANDARDIZED TEST SCORES:
increased
6%
over
3 years

AI & Networks

Computer networks are essential to our daily lives

Operating a network is very complex — 100s of failure points

The data deluge enables ML-AI and it will make its use inevitable

Because of the complexity, the speed and type of data new ML approaches are needed

It’s happening and it’s a great opportunity to explore and have deep impact

Applied ML Days 2019

AI & Language

Shiny new tools

La ngua geis ha rd.

La ngua geis ha rd.

And there are many languages.

More context inputs

Better representations

Unsupervised approaches

Focus on the problem

Keynotes:
Predicting for the Adaptive **Transport system** with *Francisco Pereira*

Cross-domain street scene semantic segmentation with *Matthieu Cord*

The **challenge** of Cooperative Autonomous Driving with *Arnaud de La Fortelle*

Bayesian inference to learn and **predict road user** behaviours with *Julian Kooij*

Beyond Supervised Driving with *Adrien Gaidon*

Spotlights:
Racing with Deep Reinforcement Learning with Sunil Mallya
Integrating Vehicle Routing and Resource Allocation in a Pharmaceutical Network with Roxanne Tison
Online recognition of elevator-specific user activity context using mobile phone with Alberto Chiappa
Walking in a world with self-driving cars? with Mark Meeder
Multi Agent reinforcement learning for train dispatching with Erik Nygren, Adrian Egli

AI & Security

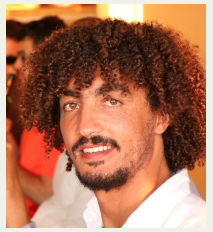
A Marauder's Map of Security and Privacy in Machine Learning

09:01-09:25 January 29 · with Nicolas Papernot

@NicolasPapernot

Byzantine Machine Learning: Safeguarding AI from Data Poisoning and Hacked Machines

09:25-09:35 January 29 · with El Mahdi El Mhamdi



@L_badikho

The past, present and future of generative models

09:35-10:00 January 29 · with Mihaela Rosca

@elaClaudia

Building a security ML-based startup from scratch

10:00-10:20 January 29 · with Raul Popa

@raulpopa

Adversarial Vision Challenge

10:20-10:30 January 29 · with Sharada Mohanty

@MeMohanty