



Marek

Jarek

Stanek

Pawel

Darek

Michał

Janek

Some girls

Mateusz

Adam

Bartek

Wojtek

Jakub

Karol

Piotr

Artur

Dawid

Piotr

Pawel

Bolesław

Karolina

Grzegorz

Jan

Jakub

Pies Saba

Piotr

Zdzis

Ty

Kot Prezesa

We value people!

Our goals:

- Create environment where students can thrive.
- Where you can find help on your way to greatness!
- Where we can share knowledge and take part in exciting projects.



What awaits you this
year at Gradient?

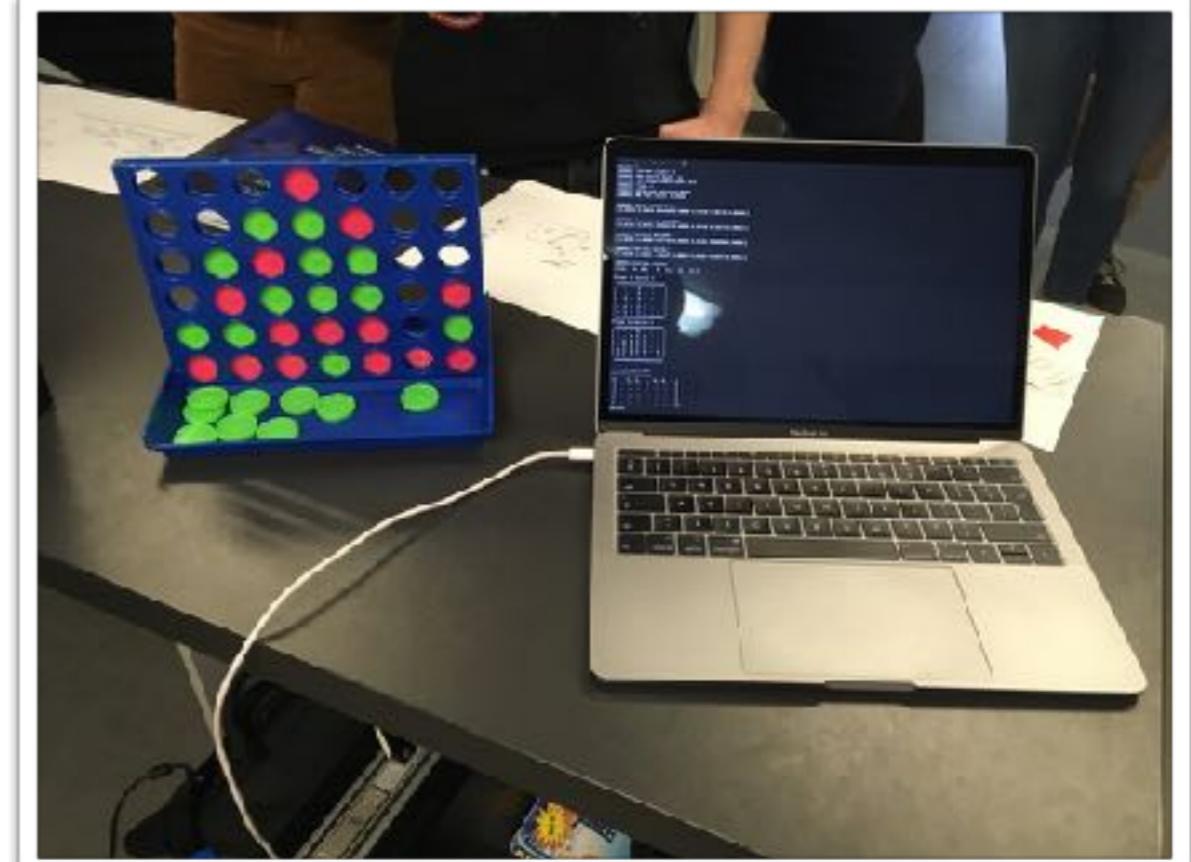
Introduction to Deep Learning in four weeks from four perspectives

1. *Machine Learning and Supervised Learning basics in Keras* by Jakub Powierza on 8 Nov.
2. *Deep Supervised Learning and Transfer Learning* by Grzegorz Beringer on 15 Nov.
3. *Introduction to Recurrent Neural Networks, presentation from International Summer School 2018 on PG* by mgr Karol Draszawka on 22 Nov.
4. *Deep Reinforcement Learning through Policy Iteration and AlphaZero* by Piotr Januszewski on 29 Nov.



We are
waiting for
your
proposals!

Start your project early!

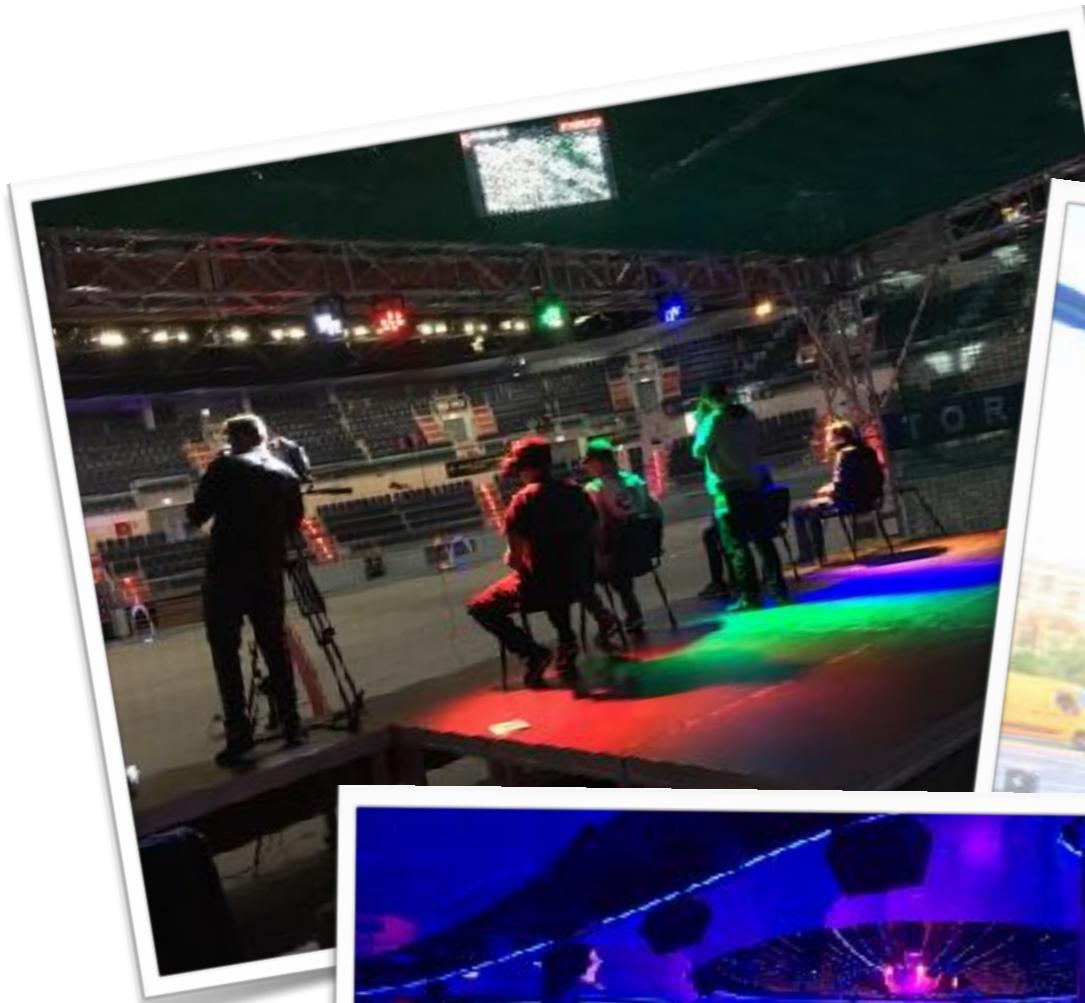


But also...

- Access to DataCamp platform.
- You can pass some projects/subjects on university or do your Engineer's/Master's thesis with project developed in Gradient students club.
- Means of communication Slack/Discord.
- Surveys.

Gradient activities

Students Association Networking



Gradient ❤ SKALP

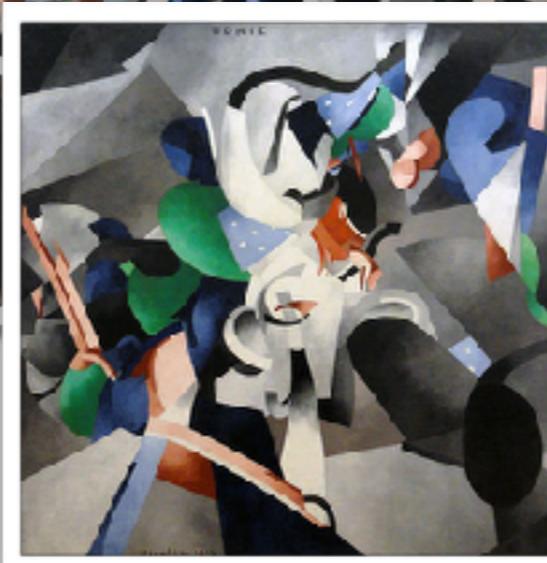
Hackathon



Forum Organizacji i Kół Akademickich



65 lecie wydziału ETI



International Summer School on Deep Learning



Gradient projects

Michał Martyniak





TENSORHIVE

Paweł Rościszewski
Michał Martyniak
Filip Schodowski
Tomasz Menet
Karol Draszawka

COMMON PROBLEMS

- More users than computing resources
- Tedious process of checking resource availability

```
# Watch nvidia
alias wn="watch --interval 1 nvidia-smi"

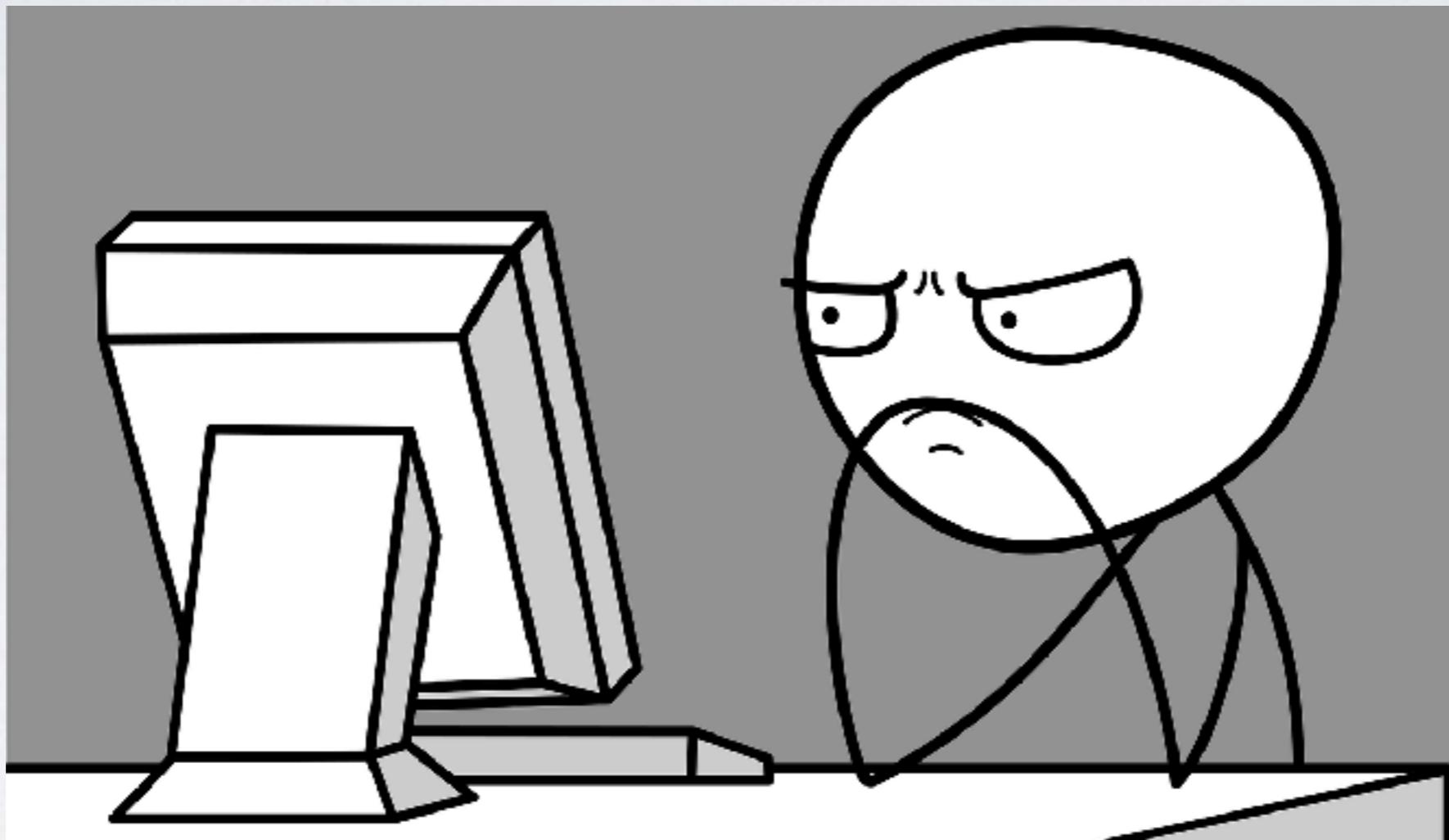
~$ nvidia-smi
Wed Oct 24 19:06:05 2018

+-----+
| NVIDIA-SMI 384.130      Driver Version: 384.130 |
|            30          |
+-----+
| GPU  Name        Persistence-M| Bus-Id      Disp.A | Volatile Uncorr. ECC |
| Fan  Temp  Perf  Pwr:Usage/Cap| Memory-Usage | GPU-Util  Compute M. |
|-----+-----+-----+-----+-----+-----+-----+
| 0  GeForce GTX 780 Ti Off  | 00000000:01:00.0 N/A |           N/A |
| 19% 42C   P8    N/A / N/A |      11MiB /  3020MiB |     N/A     Default |
|-----+-----+-----+-----+-----+-----+-----+
| 1  GeForce GTX TIT... Off  | 00000000:02:00.0 Off |           N/A |
| 22% 34C   P8    13W / 250W |      11MiB / 12207MiB |     0%     Default |
|-----+-----+-----+-----+-----+-----+-----+
+-----+
| Processes:                               GPU Memory |
| GPU  PID  Type  Process name          Usage        |
|-----+-----+-----+-----+
| 0          Not Supported               |
|-----+-----+
```

Mailing lists, direct communication, Google Calendar
proved not to work very well



Accidental interruptions + unfair usage = frustration



```
(TensorHive_conda_env) ~/Projects/TensorHive_v0.2 master pip freeze
astroid==1.6.5
autopep8==1.3.5
certifi==2018.10.15
isort==4.3.4
lazy-object-proxy==1.3.1
mccabe==0.6.1
pycodestyle==2.4.0
pylint==1.8.4
six==1.11.0
wrapt==1.10.11
(TensorHive_conda_env) ~/Projects/TensorHive_v0.2 master pip install .
Processing /Users/miczi/Projects/TensorHive_v0.2
```

~ (zsh) T1 pip (python3.6) T2 dso7 (sch) T3

```
(TensorHive_conda_env) x ~/Projects/TensorHive_v0.2 ➜ master ➜ tensorhive
TensorHive 0.2
INFO | 2018-10-24 23:33:29 | MainThread | MSG: [•] Reading main config from ~/.config/TensorHive/main_config.ini
INFO | 2018-10-24 23:33:29 | MainThread | MSG: [•] Reading hosts config from ~/.config/TensorHive/hosts_config.ini
INFO | 2018-10-24 23:33:29 | MainThread | MSG: [•] Reading proxy config from ~/.config/TensorHive/hosts_config.ini
INFO | 2018-10-24 23:33:30 | MainThread | MSG: [•] Database found (sqlite:///Users/miczi/.config/TensorHive/database.sqlite)
Database has no users.
Would you like to create a user account? [Y/n]:
[1/3] username: th_admin
[2/3] password (at least 8 characters):
[2/3] password (repeated):
[3/3] admin account? [y/N]: y
Account created successfully.
Would you like to create a user account? [y/N]: n
INFO | 2018-10-24 23:33:41 | MainThread | MSG: [e] Testing SSH configuration...
INFO | 2018-10-24 23:33:44 | MainThread | MSG: [✓] des17.kask      OK
INFO | 2018-10-24 23:33:44 | MainThread | MSG: [e] Initializing services...
INFO | 2018-10-24 23:33:44 | MonitoringService_Thread-2 | MSG: [e] Starting MonitoringService_Thread-2
INFO | 2018-10-24 23:33:44 | ProtectionService_Thread-3 | MSG: [e] Starting ProtectionService_Thread-3
INFO | 2018-10-24 23:33:44 | MainThread | MSG: [e] Starting Vue web app with gunicorn backend
INFO | 2018-10-24 23:33:44 | MainThread | MSG: [✓] Web App available at: http://0.0.0.0:5000
INFO | 2018-10-24 23:33:45 | MainThread | MSG: [e] Starting API server with gevent backend
INFO | 2018-10-24 23:33:45 | MainThread | MSG: [✓] API documentation (Swagger UI) available at: http://0.0.0.0:1111/api/0.2/ui/
^CKeyboardInterrupt
2018-10-24T21:33:52Z
[!] Shutting down TensorHive...
INFO | 2018-10-24 23:33:52 | MainThread | MSG: [e] Shutting down all services...
INFO | 2018-10-24 23:33:52 | MainThread | MSG: [✓] Stopped MonitoringService_Thread-2
INFO | 2018-10-24 23:33:52 | MainThread | MSG: [✓] Stopped ProtectionService_Thread-3
(TensorHive_conda_env) ~/Projects/TensorHive_v0.2 ➜ master ➜
```

hosts_config.ini x

```
1 [localhost]
2 user = foobar
3
4
```

hosts_config.ini x

```
1 [des15.kask]
2 user = s12345
3
4 [des16.kask]
5 user = foobar
6
7 [des17.kask]
8 user = foobar
9
10 [des18.kask]
11 user = foobar
12
13 [proxy_tunneling]
14 enabled = yes
15 proxy_host = kask.eti.pg.gda.pl
16 proxy_user = s12345
```

in_admin

Home > Nodes overview

Nodes overview

Informations about nodes

ADD WATCH

des13.kask

GPU

gpu_util



des15.kask

GPU

mem_used



des13.kask

GPU

processes



GPU index	owner	pid	command
0	root	1476	X
0	s16	4658	python

des13.kask

GPU

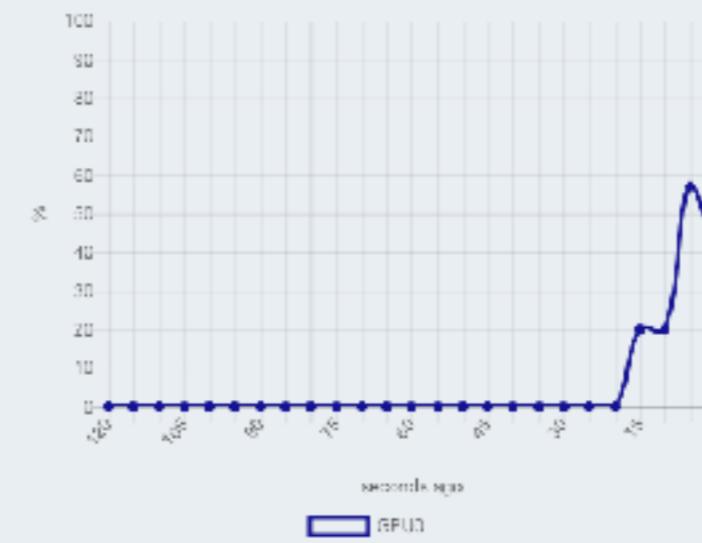
mem_util



des15.kask

GPU

mem_util

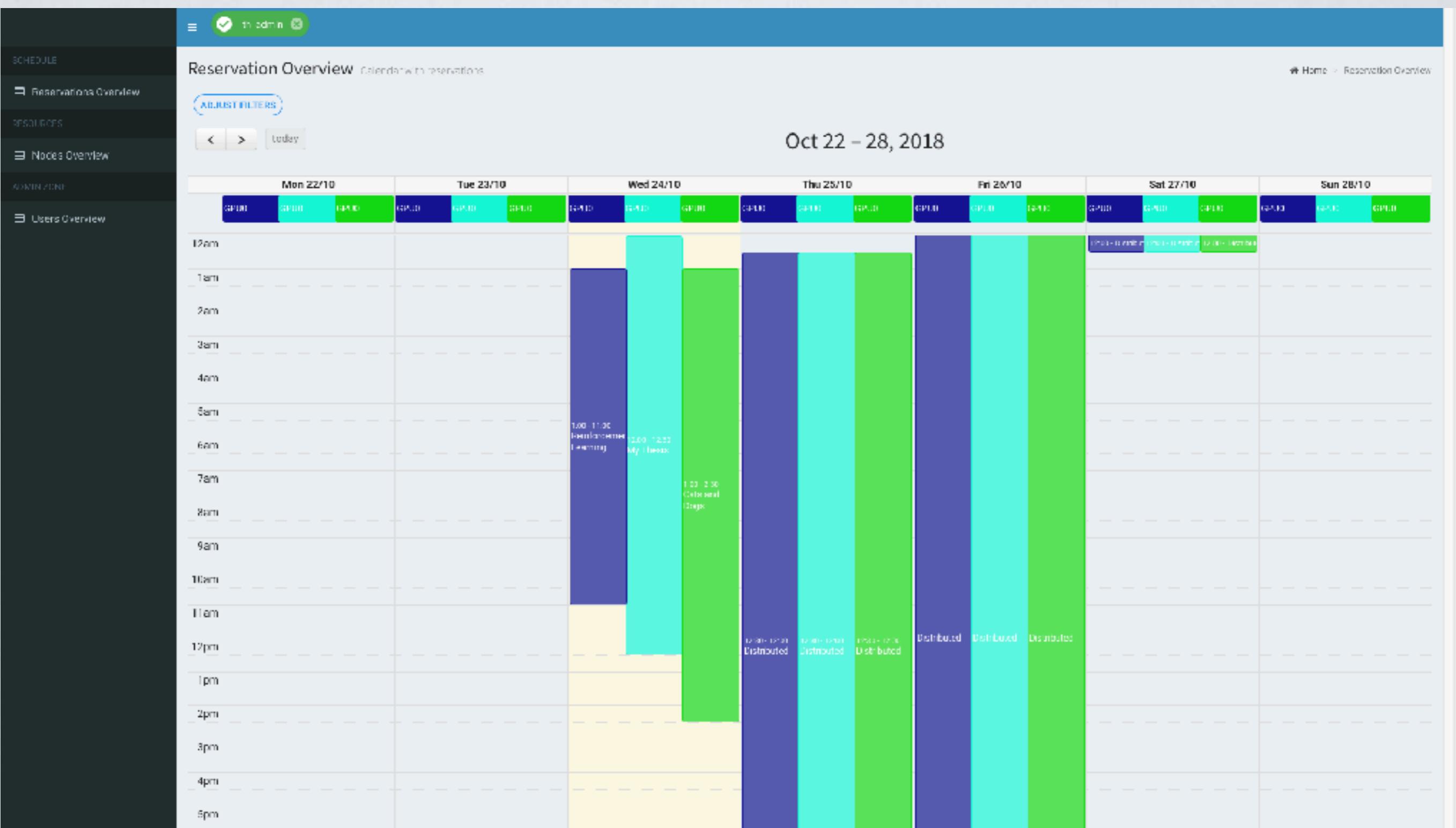


des17.kask

GPU

mem_util





OUR SOLUTION

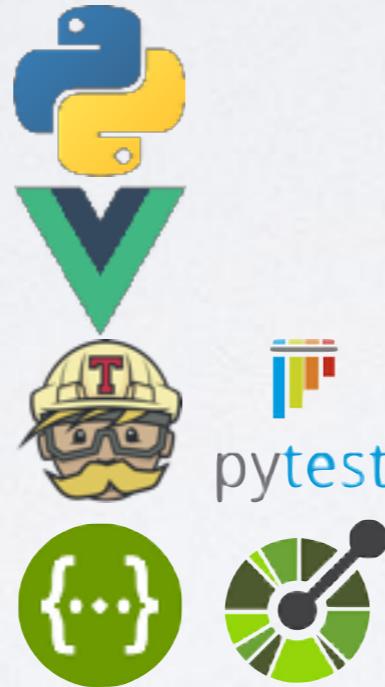
-  Monitor all relevant parameters live from a browser
-  Users are obliged to make reservations in advance
-  Reservations will be protected (! + 📬 + 💣)
-  Trivial installation & configuration (SSH-based)
-  Administrator will set up custom rules
-  Well documented API with examples

TensorHive

462 commits

release v0.2 pypi v0.2 platform Linux python 3.5 | 3.6 | 3.7 license Apache 2.0

- Python 3, flake8
- Vue.js
- Travis CI, pytest
- SwaggerUI, OpenAPI



nodes

Show/Hide List Operations | Expand Operations

GET	/nodes/hostnames	Get all hostnames
GET	/nodes/metrics	Get each node's all metric data
GET	/nodes/{hostname}/gpu/info	Get node's basic GPU information
GET	/nodes/{hostname}/gpu/metrics	Get node's GPU metric data
GET	/nodes/{hostname}/gpu/processes	Get node's GPU processes data

Implementation Notes
Puts null if some data is unavailable

Response Class (Status 200)
OK

Model | Example Value

```
{  
    "<GPU_UUID>": [  
        {  
            "command": "python",  
            "owner": "foo",  
            "pid": 1111  
        },  
        {  
            "command": "java",  
            "owner": "bar",  
            "pid": 2222  
        }  
    ]  
}
```

Response Content Type application/json

Parameters

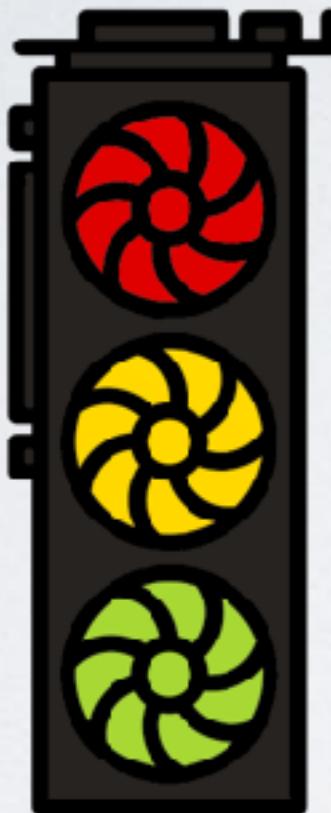
Parameter	Value	Description	Parameter Type	Data Type
hostname	(required)	Node's hostname in the network	path	string

Response Messages

HTTP Status Code	Reason	Response Model	Headers
401	Unauthorized		
404	Hostname has not been found		
422	Authorization error		

Try It Out!

THANKS!



Contact

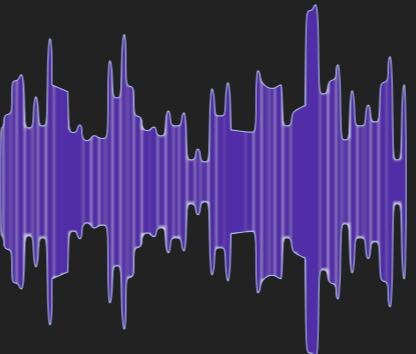
Repo

Paweł Rościszewski
pawel.rosciszewski@pg.edu.pl

Michał Martyniak
michal.martyniak@linux.pl

github.com/roscisz/TensorHive

INSTRONIZER



MIR & DNN Project

Thesis supervisor: mgr inż. Jan Cychnerski
Michał Martyniak

Filip Schodowski

Maciej Rutkowski

Instronizer

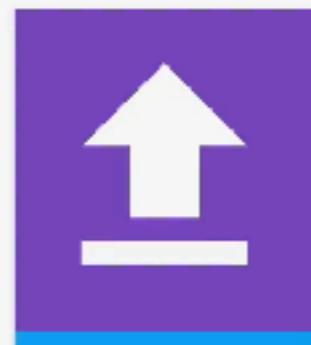
Instrument identification system based on Deep Neural Networks

DEMO

IMPLEMENTATION DETAILS

ABOUT

CONTACT



Choose audio file to classify

WAV, FLAC and MP3 files below 50MB

File name

Info! Instronizer was taught to detect 6 instruments:
Cello, Acoustic guitar, Electric guitar, Piano, Church organs and Violin.



You can upload a file containing any instrument, but the excerpts will be classified as a combination
of the instruments specified above.

[VIEW SOURCE CODE](#)

Instronizer

Instrument identification system based on Deep Neural Networks

DEMO

IMPLEMENTATION DETAILS

ABOUT

CONTACT



Classification results

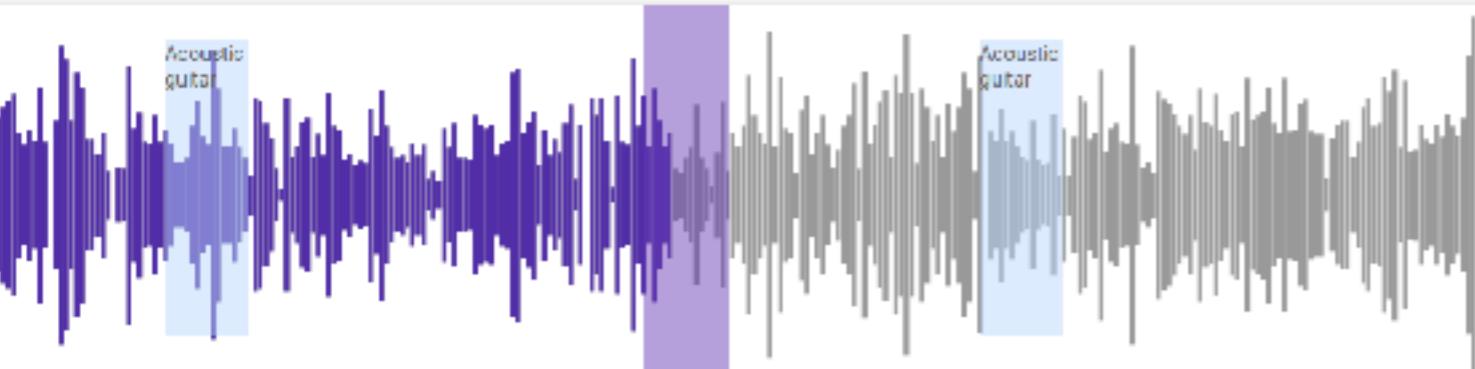
Choose audio file to classify
WAV, FLAC and MP3 files below 50MB

see_you_again_khalta_fingerstyle_2m.wa

Info! Instronizer was taught to detect 6 instruments:
Cello, Acoustic guitar, Electric guitar, Piano, Church organs and Violin.

You can upload a file containing any instrument, but the excerpts will be classified as a combination of the instruments specified above.

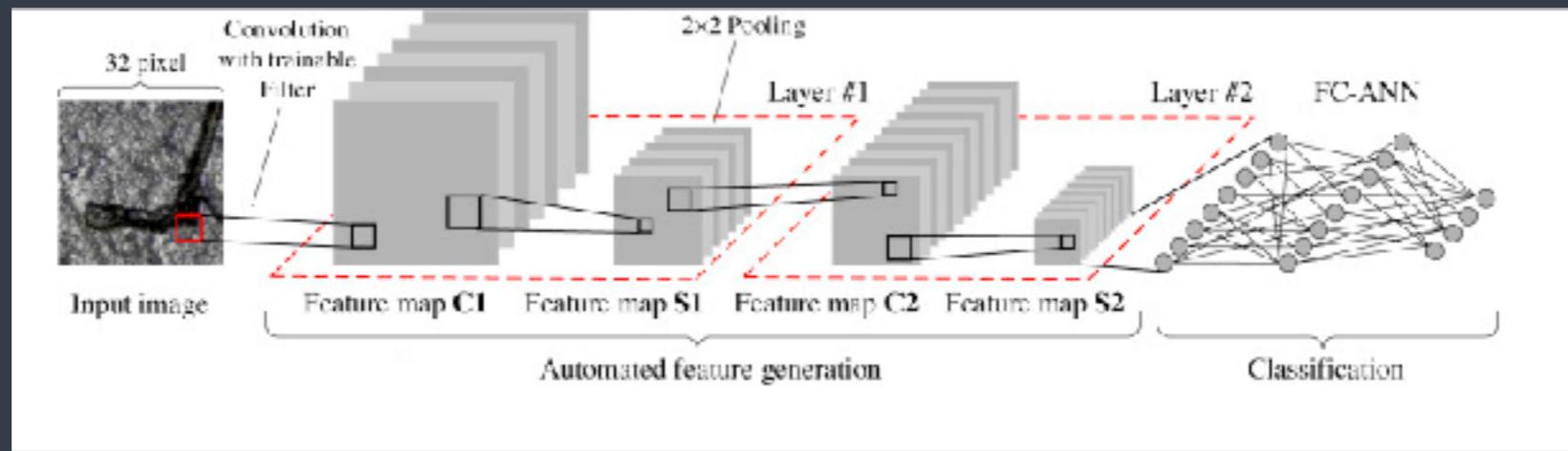
[VIEW SOURCE CODE](#)



0:21 until the uploaded file is deleted from server
Double click on result region to delete it

Zoom: 0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600 7700 7800 7900 8000 8100 8200 8300 8400 8500 8600 8700 8800 8900 9000 9100 9200 9300 9400 9500 9600 9700 9800 9900 10000 10100 10200 10300 10400 10500 10600 10700 10800 10900 11000 11100 11200 11300 11400 11500 11600 11700 11800 11900 12000 12100 12200 12300 12400 12500 12600 12700 12800 12900 13000 13100 13200 13300 13400 13500 13600 13700 13800 13900 14000 14100 14200 14300 14400 14500 14600 14700 14800 14900 15000 15100 15200 15300 15400 15500 15600 15700 15800 15900 16000 16100 16200 16300 16400 16500 16600 16700 16800 16900 17000 17100 17200 17300 17400 17500 17600 17700 17800 17900 18000 18100 18200 18300 18400 18500 18600 18700 18800 18900 19000 19100 19200 19300 19400 19500 19600 19700 19800 19900 20000 20100 20200 20300 20400 20500 20600 20700 20800 20900 21000 21100 21200 21300 21400 21500 21600 21700 21800 21900 22000 22100 22200 22300 22400 22500 22600 22700 22800 22900 23000 23100 23200 23300 23400 23500 23600 23700 23800 23900 24000 24100 24200 24300 24400 24500 24600 24700 24800 24900 25000 25100 25200 25300 25400 25500 25600 25700 25800 25900 26000 26100 26200 26300 26400 26500 26600 26700 26800 26900 27000 27100 27200 27300 27400 27500 27600 27700 27800 27900 28000 28100 28200 28300 28400 28500 28600 28700 28800 28900 29000 29100 29200 29300 29400 29500 29600 29700 29800 29900 30000 30100 30200 30300 30400 30500 30600 30700 30800 30900 31000 31100 31200 31300 31400 31500 31600 31700 31800 31900 32000 32100 32200 32300 32400 32500 32600 32700 32800 32900 33000 33100 33200 33300 33400 33500 33600 33700 33800 33900 34000 34100 34200 34300 34400 34500 34600 34700 34800 34900 35000 35100 35200 35300 35400 35500 35600 35700 35800 35900 36000 36100 36200 36300 36400 36500 36600 36700 36800 36900 37000 37100 37200 37300 37400 37500 37600 37700 37800 37900 38000 38100 38200 38300 38400 38500 38600 38700 38800 38900 39000 39100 39200 39300 39400 39500 39600 39700 39800 39900 40000 40100 40200 40300 40400 40500 40600 40700 40800 40900 41000 41100 41200 41300 41400 41500 41600 41700 41800 41900 42000 42100 42200 42300 42400 42500 42600 42700 42800 42900 43000 43100 43200 43300 43400 43500 43600 43700 43800 43900 44000 44100 44200 44300 44400 44500 44600 44700 44800 44900 45000 45100 45200 45300 45400 45500 45600 45700 45800 45900 46000 46100 46200 46300 46400 46500 46600 46700 46800 46900 47000 47100 47200 47300 47400 47500 47600 47700 47800 47900 48000 48100 48200 48300 48400 48500 48600 48700 48800 48900 49000 49100 49200 49300 49400 49500 49600 49700 49800 49900 50000 50100 50200 50300 50400 50500 50600 50700 50800 50900 51000 51100 51200 51300 51400 51500 51600 51700 51800 51900 52000 52100 52200 52300 52400 52500 52600 52700 52800 52900 53000 53100 53200 53300 53400 53500 53600 53700 53800 53900 54000 54100 54200 54300 54400 54500 54600 54700 54800 54900 55000 55100 55200 55300 55400 55500 55600 55700 55800 55900 56000 56100 56200 56300 56400 56500 56600 56700 56800 56900 57000 57100 57200 57300 57400 57500 57600 57700 57800 57900 58000 58100 58200 58300 58400 58500 58600 58700 58800 58900 59000 59100 59200 59300 59400 59500 59600 59700 59800 59900 60000 60100 60200 60300 60400 60500 60600 60700 60800 60900 61000 61100 61200 61300 61400 61500 61600 61700 61800 61900 62000 62100 62200 62300 62400 62500 62600 62700 62800 62900 63000 63100 63200 63300 63400 63500 63600 63700 63800 63900 64000 64100 64200 64300 64400 64500 64600 64700 64800 64900 65000 65100 65200 65300 65400 65500 65600 65700 65800 65900 66000 66100 66200 66300 66400 66500 66600 66700 66800 66900 67000 67100 67200 67300 67400 67500 67600 67700 67800 67900 68000 68100 68200 68300 68400 68500 68600 68700 68800 68900 69000 69100 69200 69300 69400 69500 69600 69700 69800 69900 70000 70100 70200 70300 70400 70500 70600 70700 70800 70900 71000 71100 71200 71300 71400 71500 71600 71700 71800 71900 72000 72100 72200 72300 72400 72500 72600 72700 72800 72900 73000 73100 73200 73300 73400 73500 73600 73700 73800 73900 74000 74100 74200 74300

FIRST BABY STEPS



OVERFITTING 😞

```
Label: 7 | Prediction: 7  
Test Accuracy of the model on the 1100 test images: 99 %  
Funtion test took: 0:00:08.559456
```

POOR RESULTS 😅

```
Label: 0 | Prediction: 0  
Label: 0 | Prediction: 7  
Label: 0 | Prediction: 0  
Label: 6 | Prediction: 6  
Label: 7 | Prediction: 1  
Label: 7 | Prediction: 3  
Label: 7 | Prediction: 6  
Label: 6 | Prediction: 6  
Label: 0 | Prediction: 0  
Test Accuracy of the model on the 1187 test images: 39 %  
Funtion test took: 0:00:09.262473
```

HARDWARE



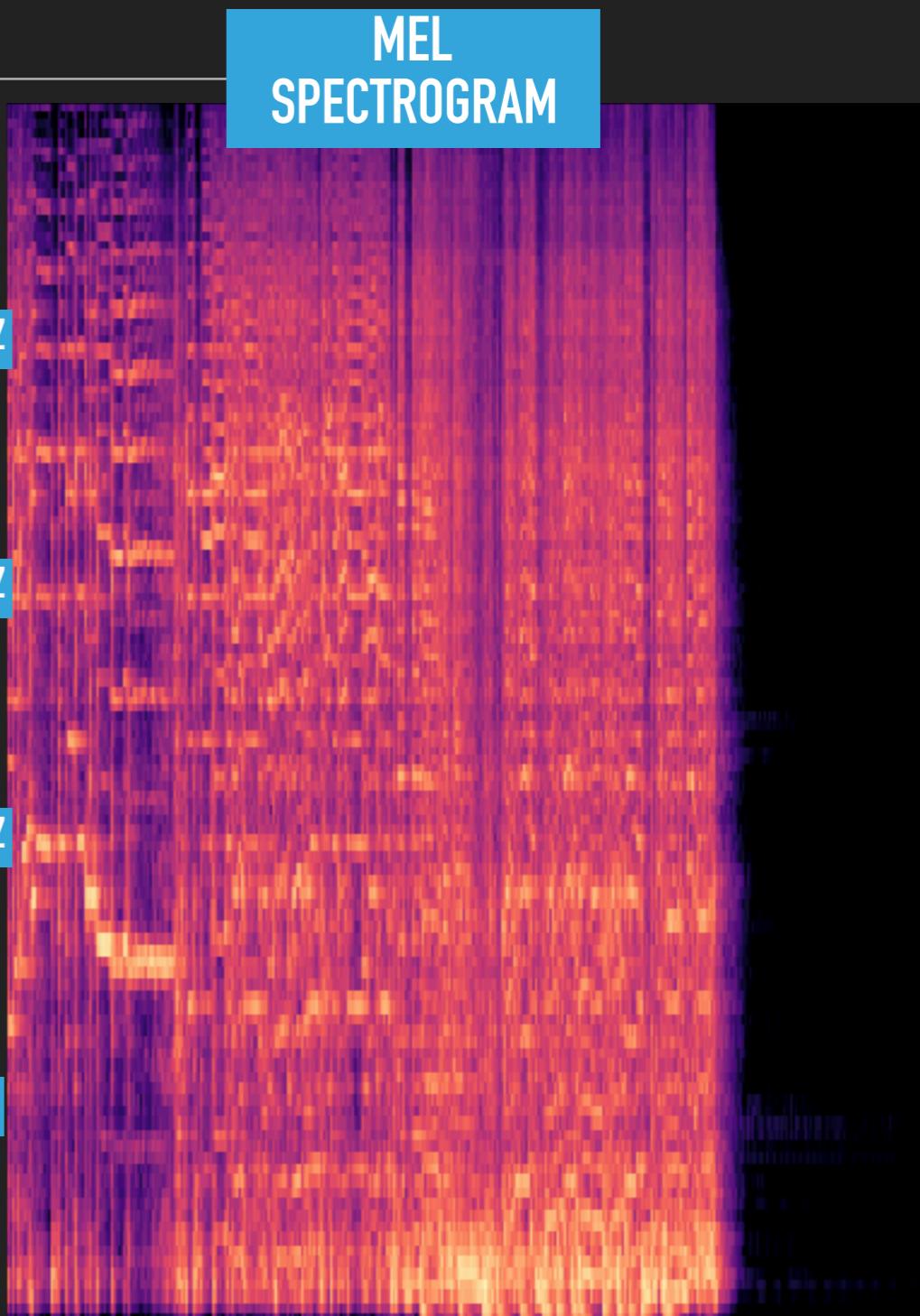
CPU
INTEL I5 HASWELL SERIA M

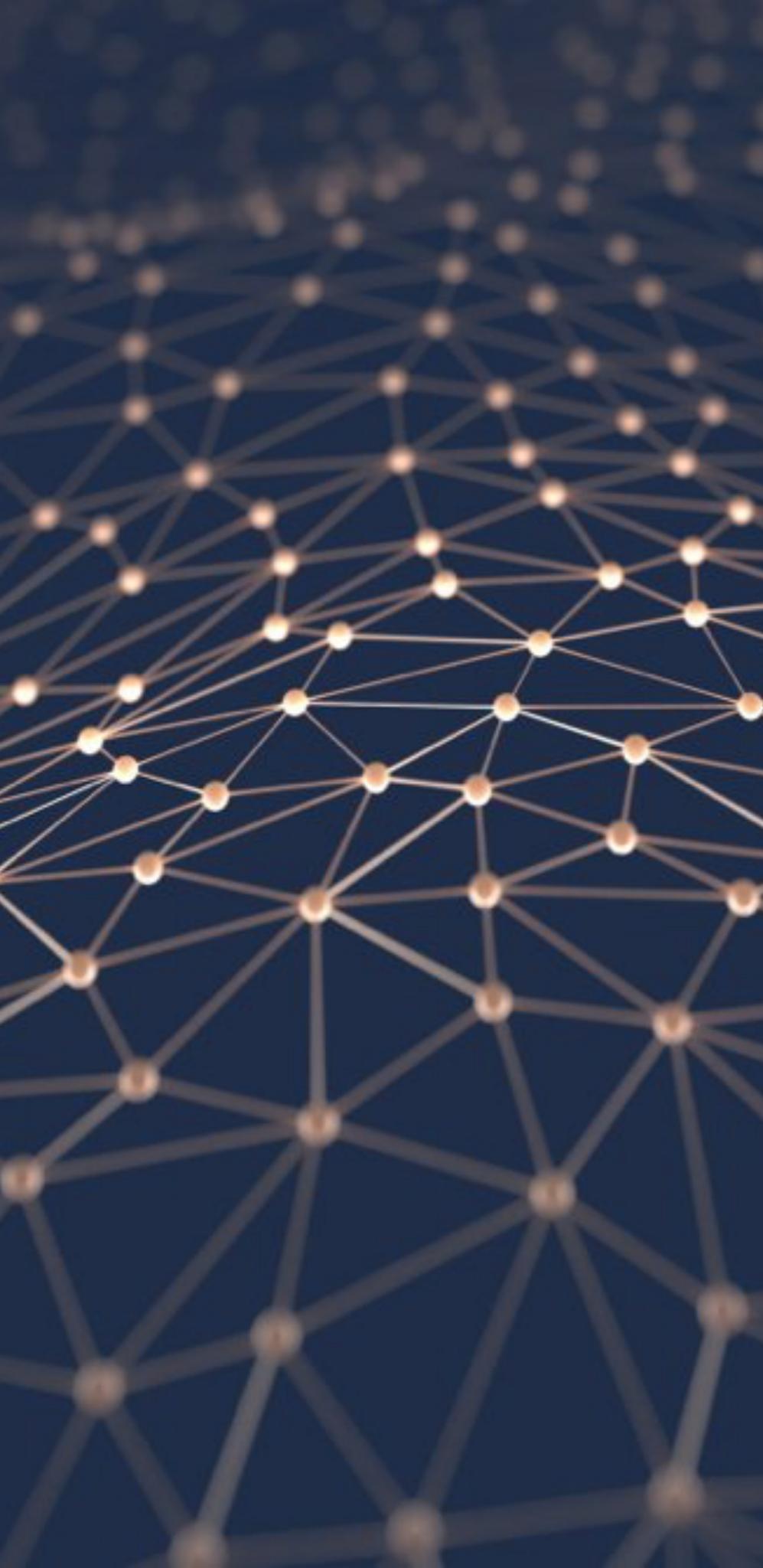
GPU 4GB VRAM
GEFORCE GTX 680

GPU 12GB VRAM
TITAN X

CHALLENGES

- ▶ Learning basically from scratch
- ▶ Quite offstream topic
- ▶ Existing datasets...
- ▶ Choosing the network model
- ▶ Finding the best input data params (size, quality, amount)
- ▶ Being patient...

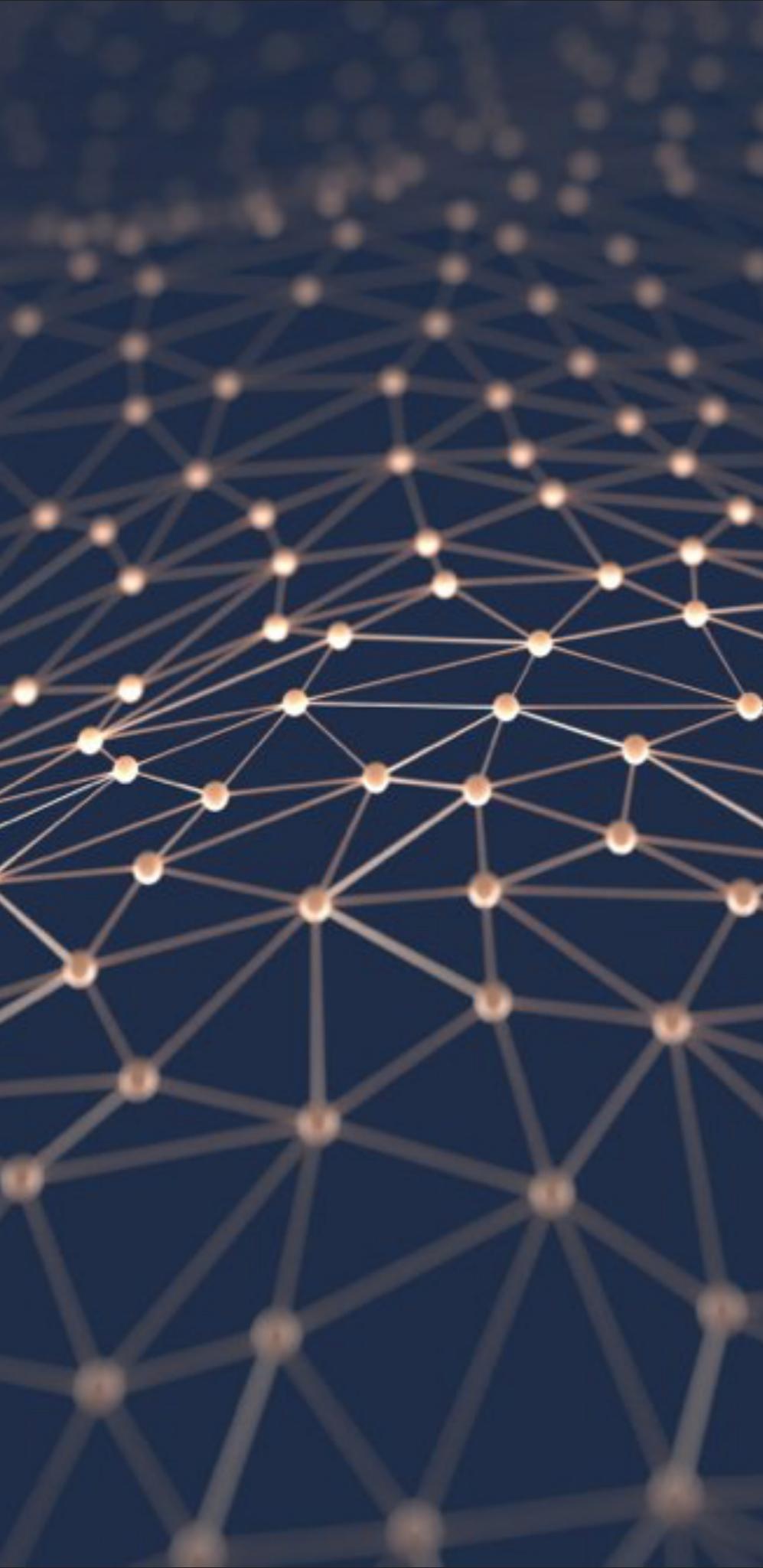




PROGRESS WE'VE MADE

- ▶ Custom YouTube dataset

```
4 [org]
5 1.
6 @get 1m26s-2m26s
7 https://www.youtube.com/watch?v=Ctykf8qh288 interstellar_first_step_zimmer
8 2.
9 @get 26s-1m26s
10 https://www.youtube.com/watch?v=UQDhH8-z14Q gigi_dagostino_lamour_toujours
11 3.
12 @get 4m36s-5m36s
13 https://www.youtube.com/watch?v=8n06m7IkSK8 derrick_jackson_organ_solo
14 4.
15 @get 21s-1m21s
16 https://www.youtube.com/watch?v=6RJz-xN4w0A wow_church_organs
17 5.
18 @get 41s-1m41s
19 https://www.youtube.com/watch?v=Sv-wIFW-pAM tetris_theme
20 6.
21 @get 30s-1m30s
22 https://www.youtube.com/watch?v=krpW9YI06Ew darth_vaders_theme
23 7.
24 @get 56s-1m23s, 1m28s-1m53s
25 https://www.youtube.com/watch?v=I8xFgvb7tQ 7_years_old_plays_church_organ
26 8.
27 @get 11s-1m11s
28 https://www.youtube.com/watch?v=wfA-dFIc8i8 master_of_puppets_theme
29 9.
30 @get 22s-1m26s
31 https://www.youtube.com/watch?v=vtzeowlbkjs poker_face
32 10.
33 @get 47s-1m47s
34 https://www.youtube.com/watch?v=4q9mA53XHGM viva_la_vida_coldplay
35 11.
```



PROGRESS WE'VE MADE

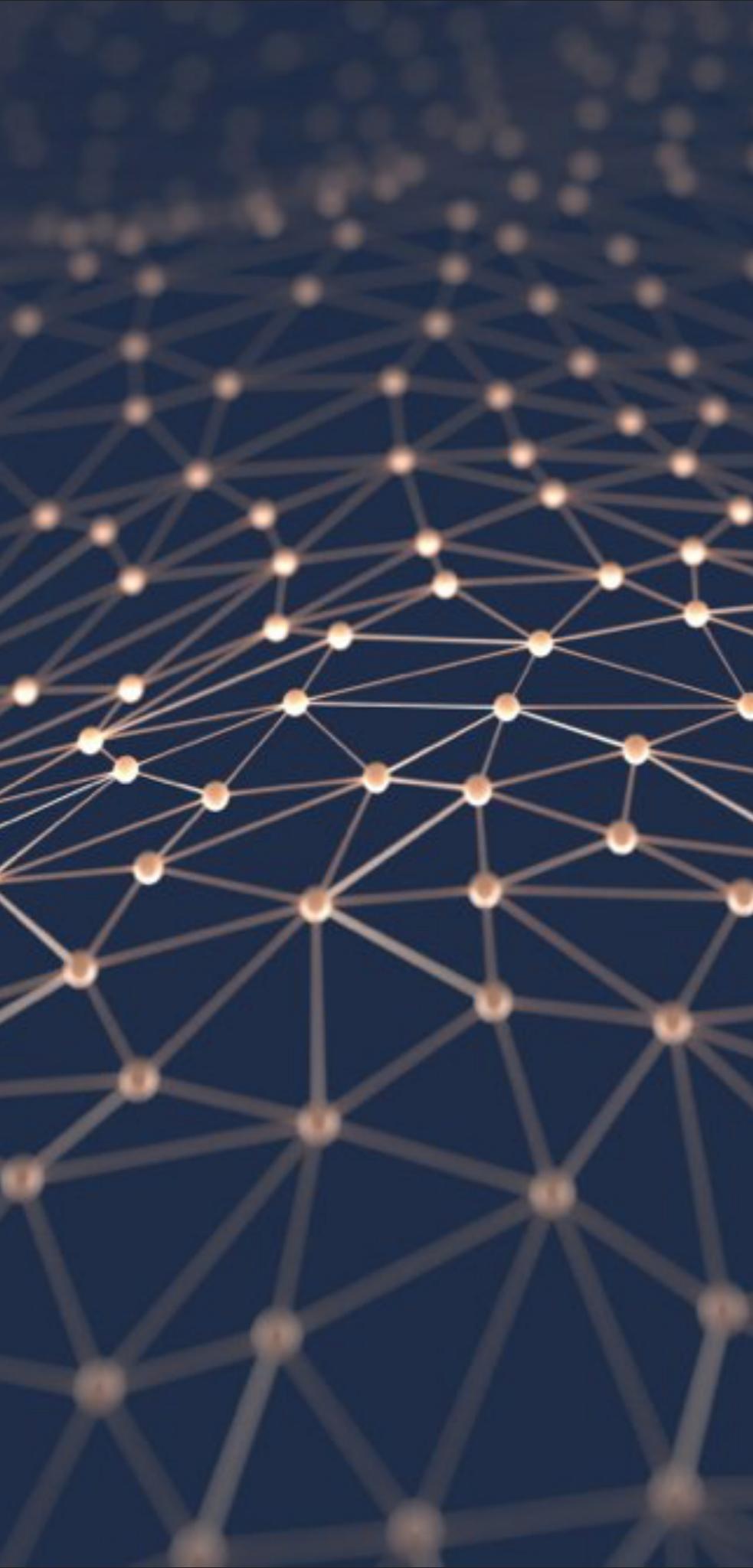
- ▶ Custom YouTube dataset
- ▶ PyTorch



Tensors and Dynamic neural networks in Python
with strong GPU acceleration.

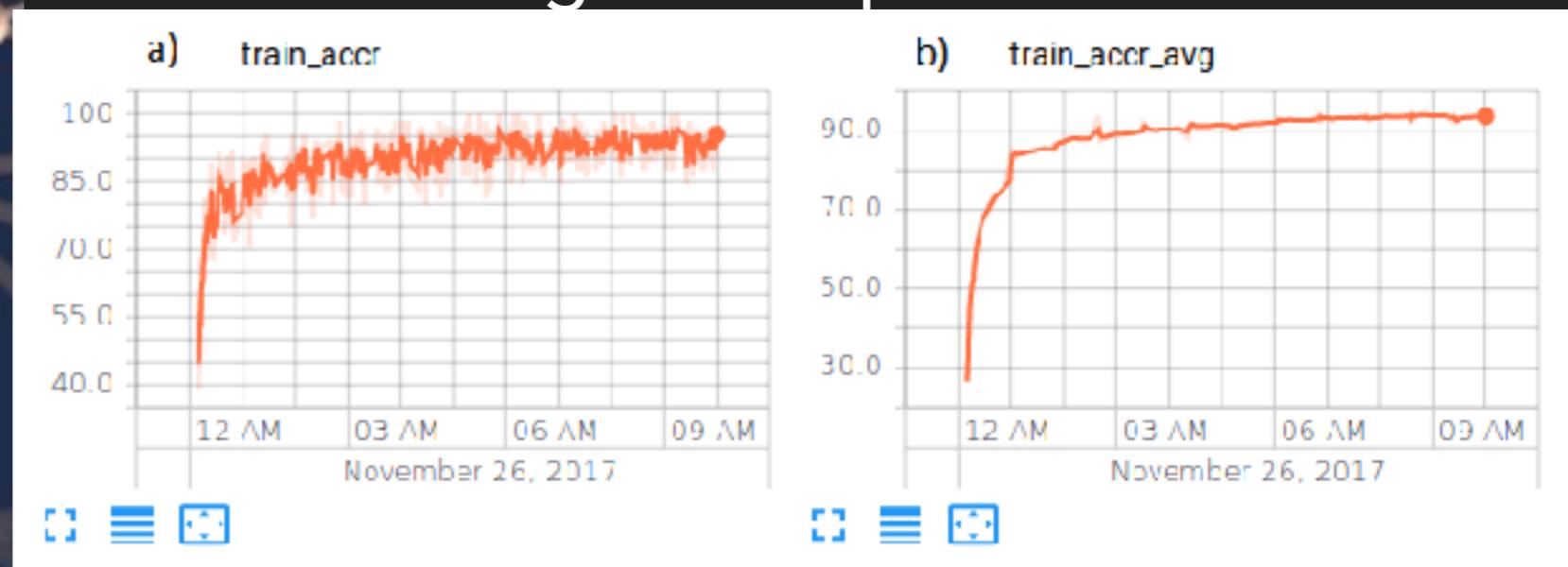
PyTorch is a deep learning framework that puts Python first.

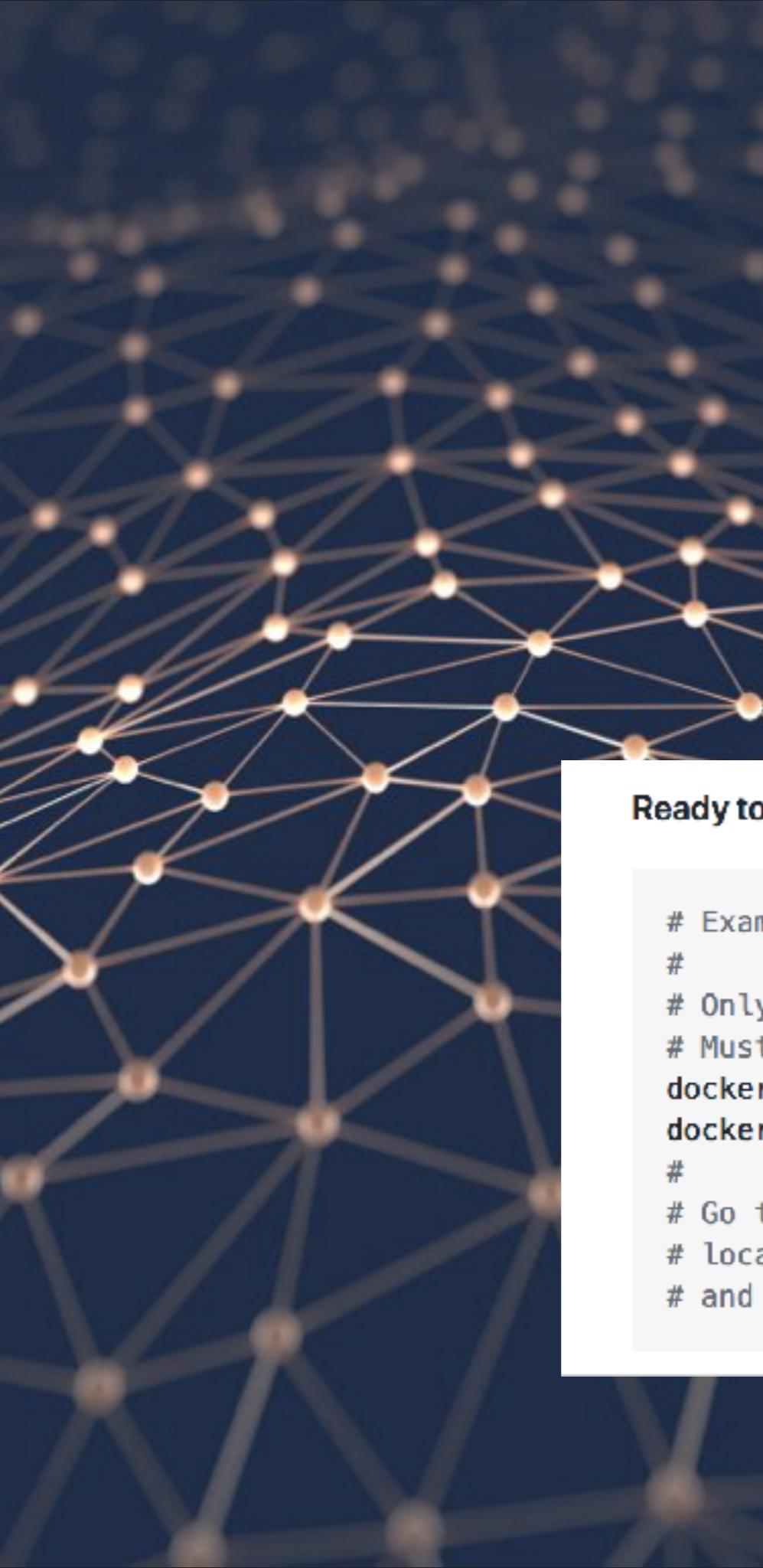
We are in an early-release Beta. Expect some adventures.



PROGRESS WE'VE MADE

- ▶ Custom YouTube dataset
- ▶ PyTorch
- ▶ TensorBoard
- ▶ Tuning model parameters



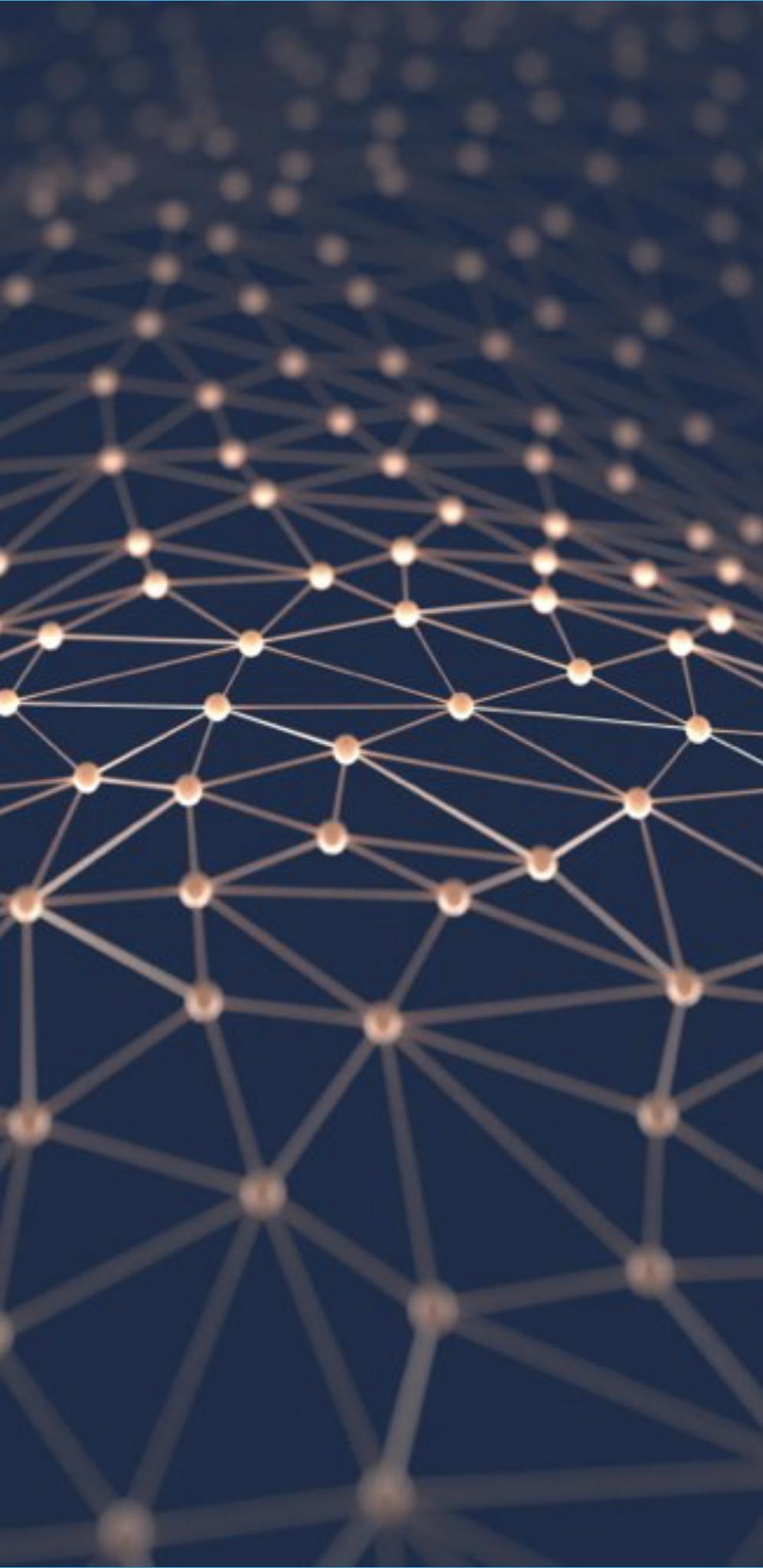


PROGRESS WE'VE MADE

- ▶ Docker

Ready to test on trained model within the web application (fully working, ready to use)

```
# Example webapp launch
#
# Only docker is required to install, deployment is trivial
# Must be in project root
docker build . --tag instronizer
docker run --interactive --tty -p 80:80 --name instronizer_container instronizer
#
# Go to your browser, type:
# localhost
# and enjoy testing :)
```



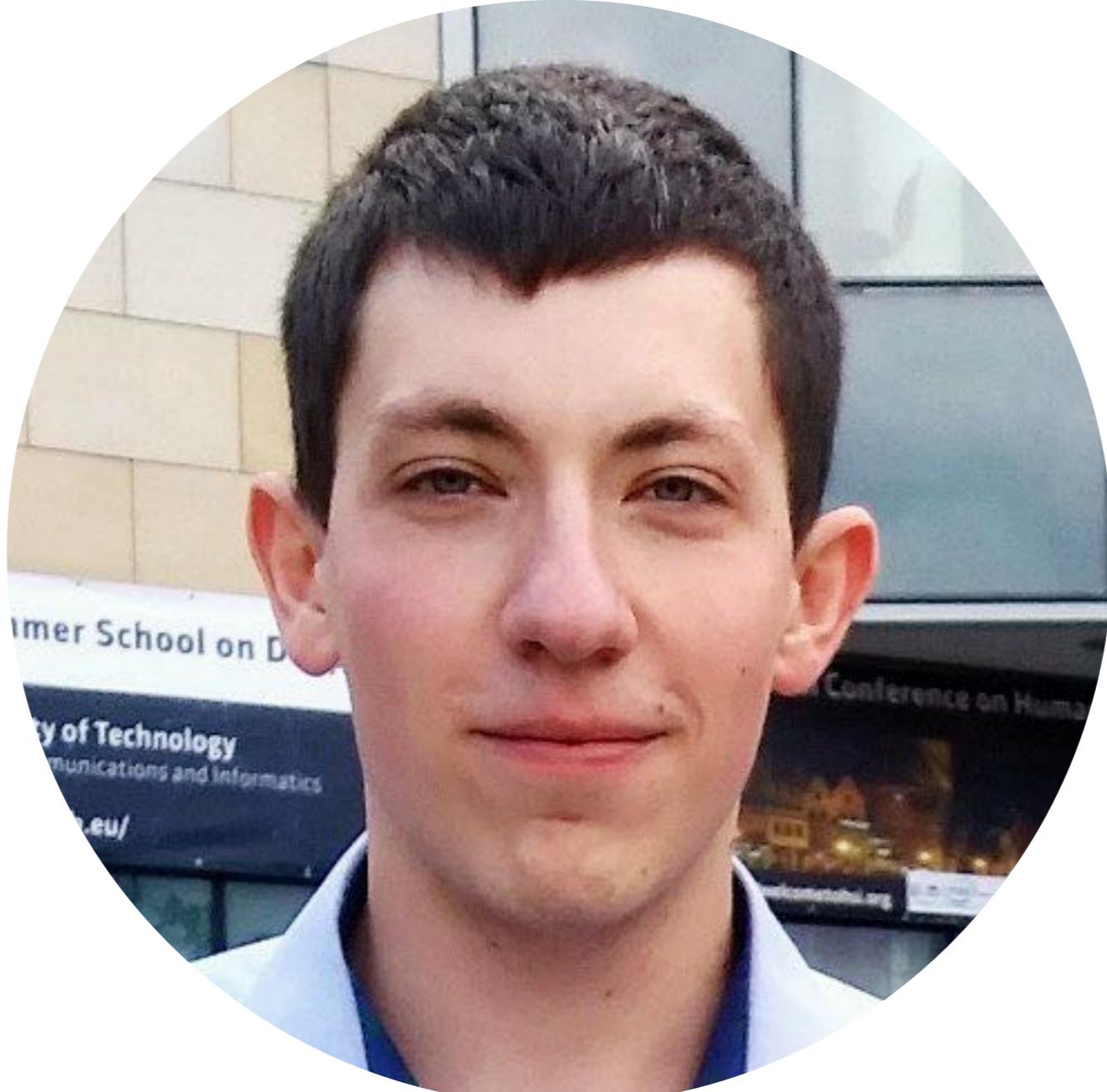
THANKS!



Michał Martyniak

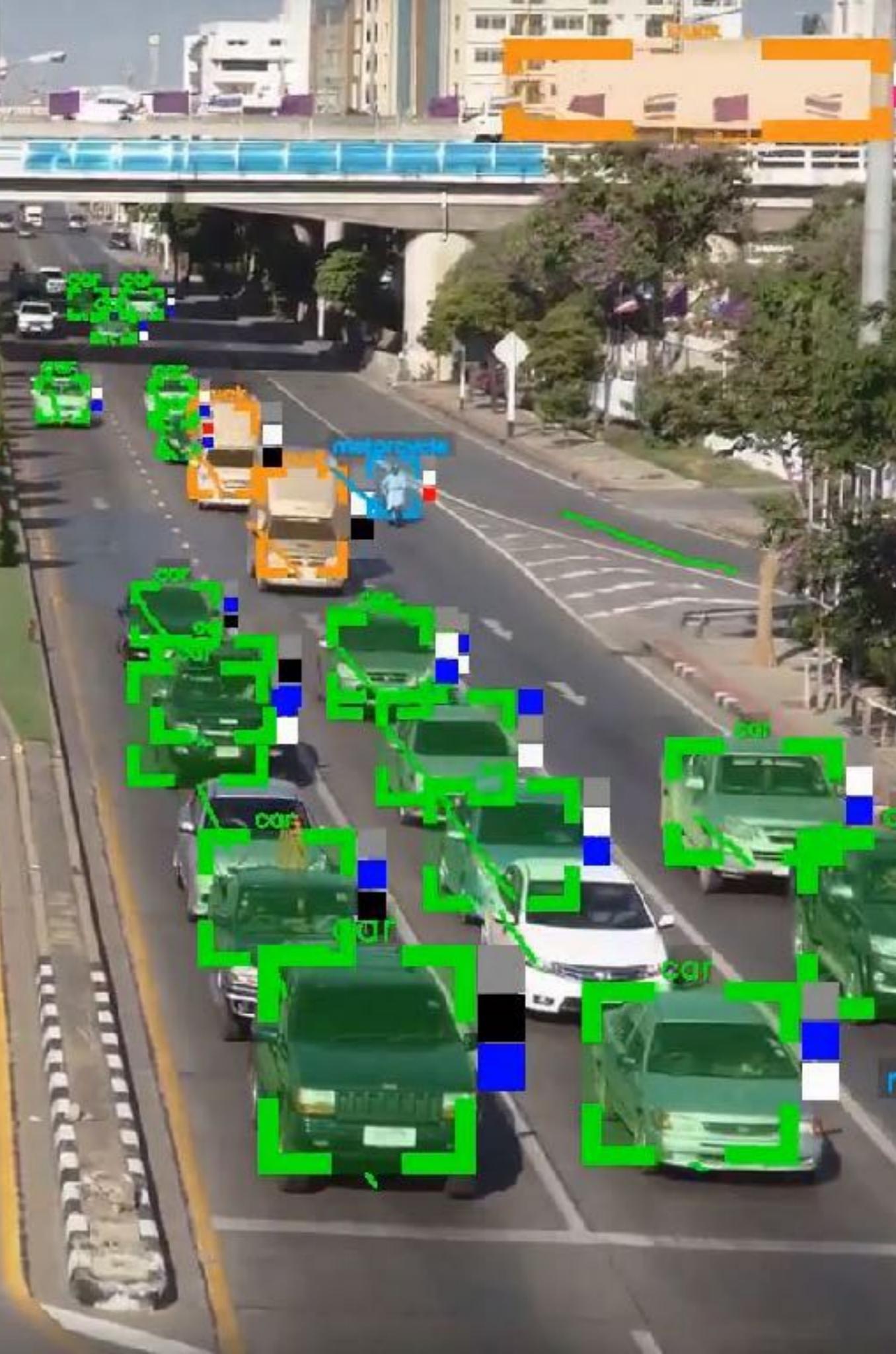
[🔗 github.com/micmarty](https://github.com/micmarty)
[🔗 martyniak.me](https://martyniak.me)

Jakub Powierza



🎓 What do I do?

- Computer Vision,
- CNNs,
- Detection,
- Segmentation,
- Medical Applications.



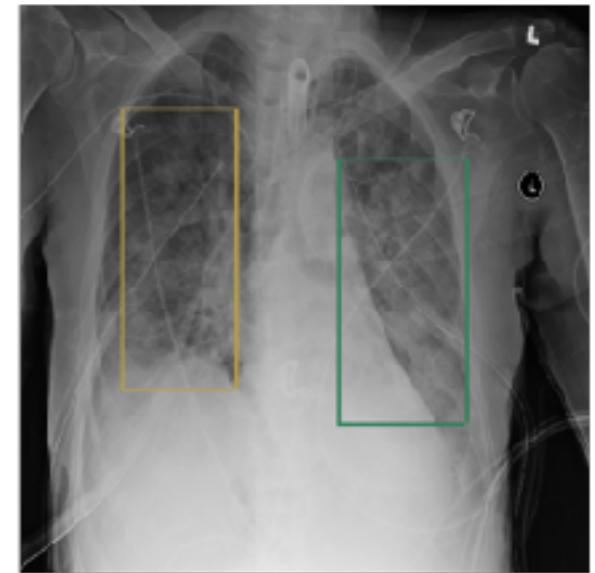
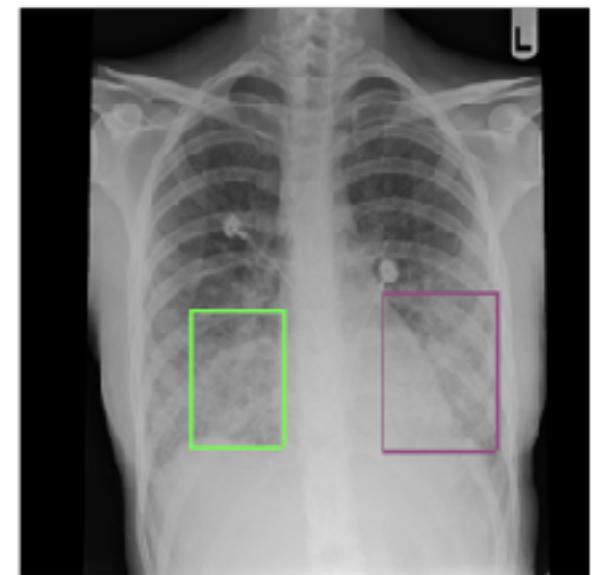


Lung Cancer

- Kaggle Data Science Bowl 2017,
- Prediction challenge,
- Predict patients risk of having lung cancer in the next 12 months.

Pneumonia Detection

- RSNA Pneumonia Detection Challenge on Kaggle,
- Detection challenge,
- Implementation of SSD in PyTorch,
- Received 300\$ on Google Cloud Platform.



* GitHub available soon!





MedTagger

Labeling and aggregation of medical datasets with a usage of a crowdsourcing idea.

MedTagger

- Medical datasets annotation,
- Crowdsourcing,
- Open Source,
- Winners of “Jaskółki Przedsiębiorczości” 2018.



MedTagger

The first open-source platform for labeling and aggregation of datasets with a usage of a crowdsourcing idea.

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jpowie01 / MedTagger

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Settings

A collaborative framework for annotating medical datasets using crowdsourcing.

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447 commits

17 branches

0 releases

9 contributors

Apache-2.0

Branch: master

New pull request

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pyup-bot and jpowie01 Update flask-cors from 3.0.4 to 3.0.6 (#475)	Latest commit bce5050 9 days ago
.github Update Issue template by adding Tasks section (#327)	3 months ago
.travis E2E Tests Automation (#467)	16 days ago
backend Update flask-cors from 3.0.4 to 3.0.6 (#475)	9 days ago
docs Fix inconsistent naming (#470)	16 days ago
e2e Fix inconsistent naming (#470)	16 days ago
frontend Fix inconsistent naming (#470)	16 days ago
.env Allow MedTagger to setup on subdirectory without trailing slash at th...	2 months ago
.gitattributes Fix Bash line endings on Windows	9 months ago
.gitignore E2E Tests Automation (#467)	16 days ago
.pyup.yml Update PyUP config to add "Under Review" label	4 months ago
.travis.yml E2E Tests Automation (#467)	16 days ago
LICENCE.txt Add README and LICENCE file	10 months ago
Makefile E2E Tests Automation (#467)	16 days ago
README.md Fix inconsistent naming (#470)	16 days ago
Momentumfile Momentum front-end setup (#107)	6 months ago

Michał Górecki





The ~~Skeleton~~ Key

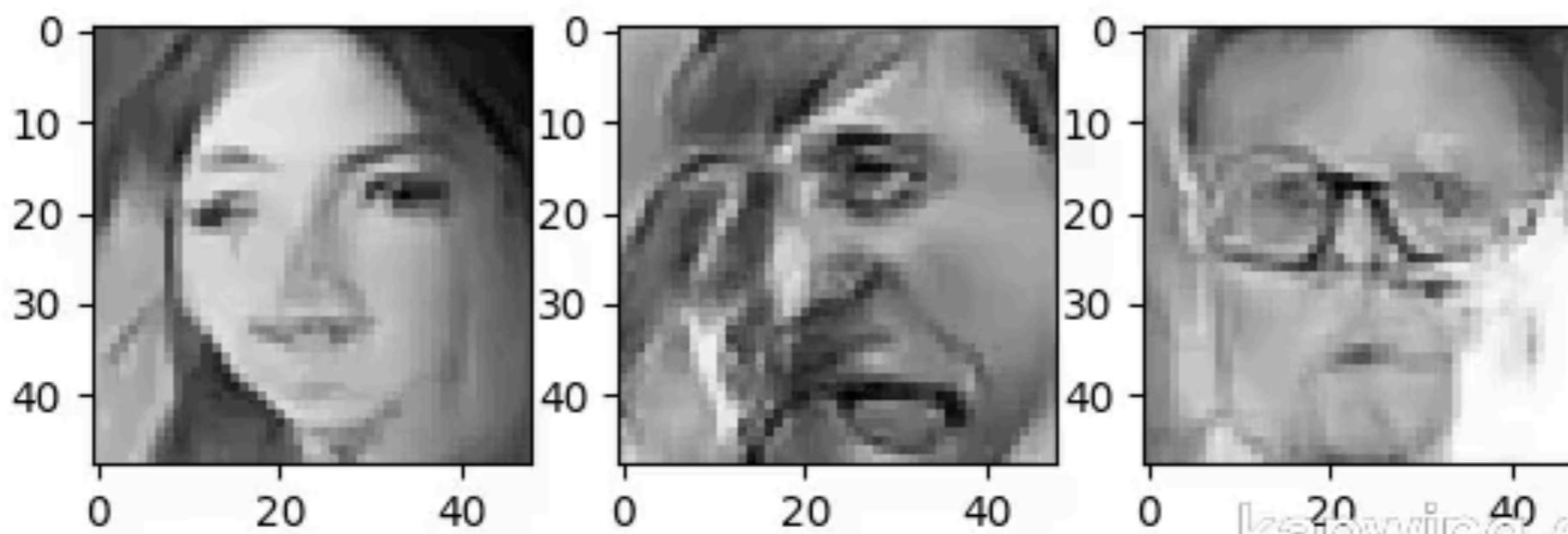
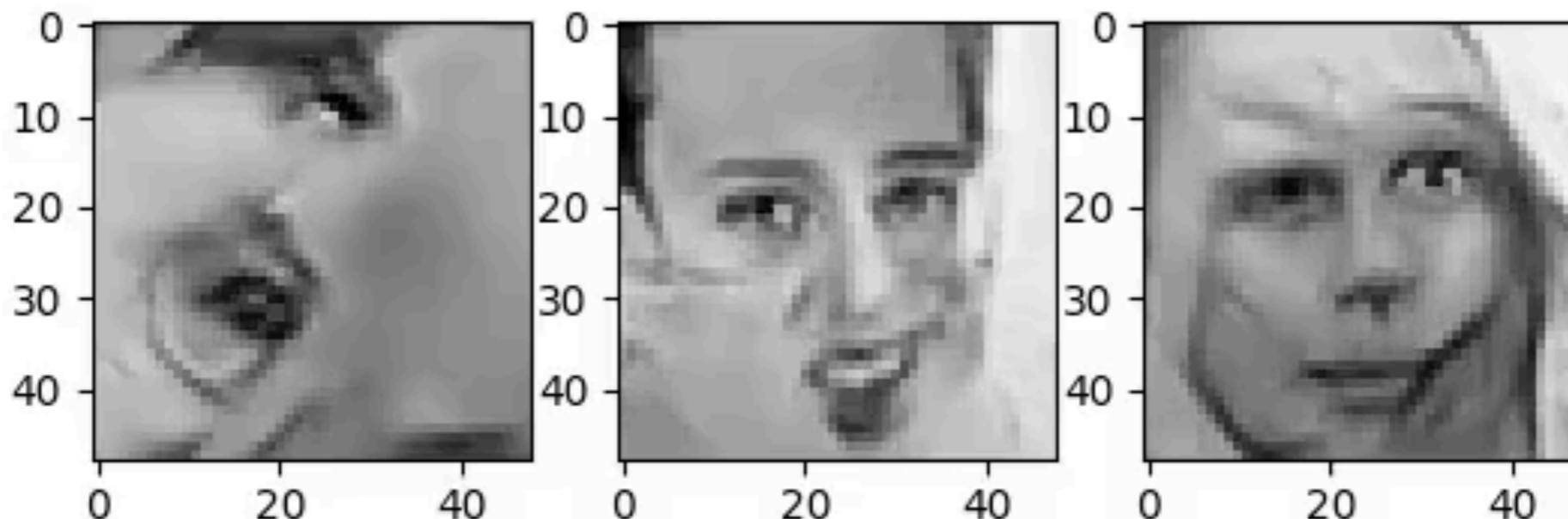
Neural Network

Unbreakable Lockpick

Music Generation

Generated by
MP3Toolbox.net

Face Generation



Bartek Borzyszkowski





GDAŃSK UNIVERSITY
OF TECHNOLOGY

Intelligent - Remote / Self-driving Car

by Bartłomiej Borzyszkowski (Poland)

*Gdansk University of Technology (ETI)
Karunya Institute of Technology and Sciences (IE)*





„Robotics in India” – Intelligent Robot project by Bartłomiej Borzyszkowski

Project introduction

The goal of the project is to build an **intelligent vehicle** that has two options of control - **remotely** (wireless communication with the computer) and **autonomously** (the robot is capable to choose the way itself, collect necessary information and react for example to road signs, traffic lights and other vehicles).

The work has started during a summer research at the Karunya Institute of Technology and Sciences in India and is continued at the Gdańsk University of Technology, at the **Gradient PG** Science Club.

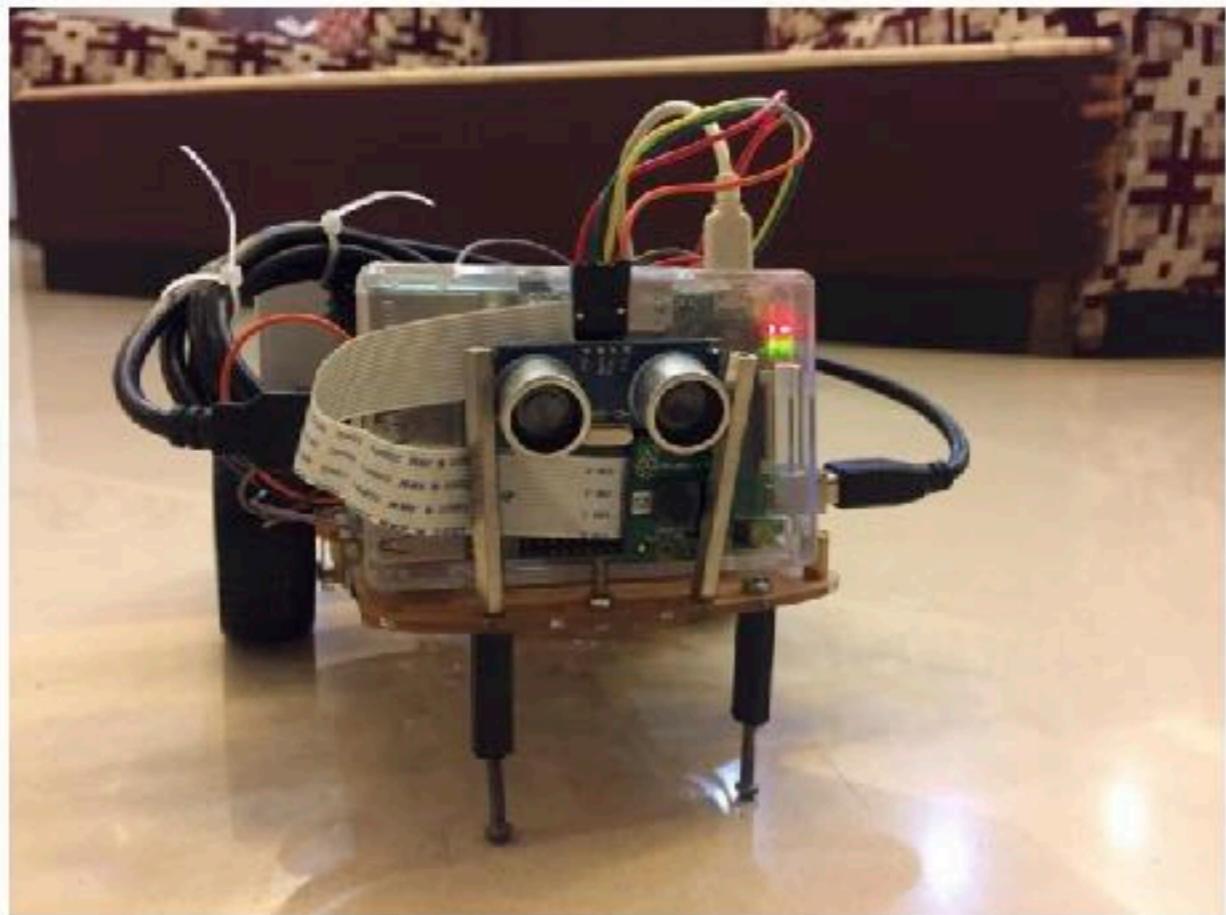


Picture of the robot with a real-time video streaming



„Robotics in India” – Intelligent Robot project by Bartłomiej Borzyszkowski

Robot overview



First version of the robot from a front

The project is based on Raspberry Pi and Arduino, using a camera and an ultrasonic sensor - data between the devices is exchanged in a real time. Robot is controlled from the laptop's keyboard, distance from any obstacles in the front is measured and the video is displayed on the screen.

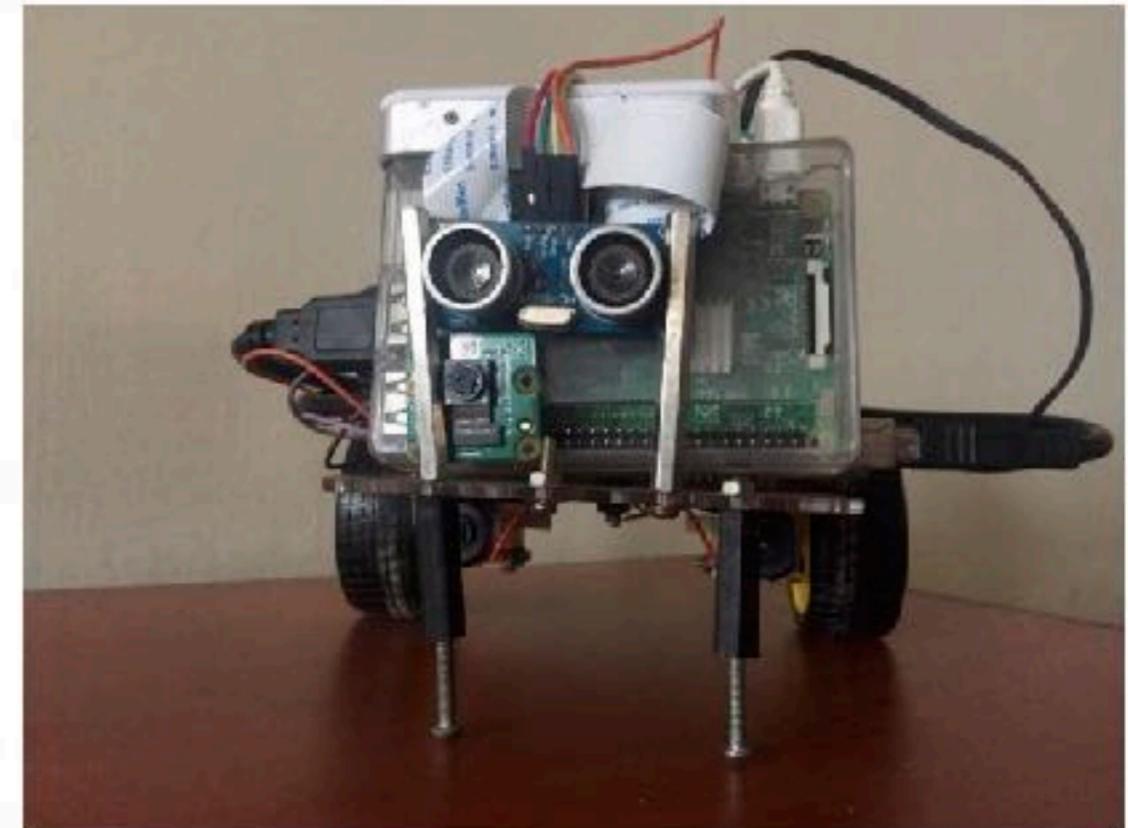
The next stage of development will be implementation of the neural network, which will enable objects recognition from the camera and making decisions based on their analysis.



Project repository

GitHub repository:

- github.com/Borzyszkowski/Robotics-in-India-Intelligent-Robot





„Robotics in India” – Intelligent Robot project by Bartłomiej Borzyszkowski

Further Develop

- **Total autonomous**
- **Road lines, signs and traffic lights recognition**
- **More advance steering**
- **Both kinds of control (self-drive and remote control) with balanced priorities**





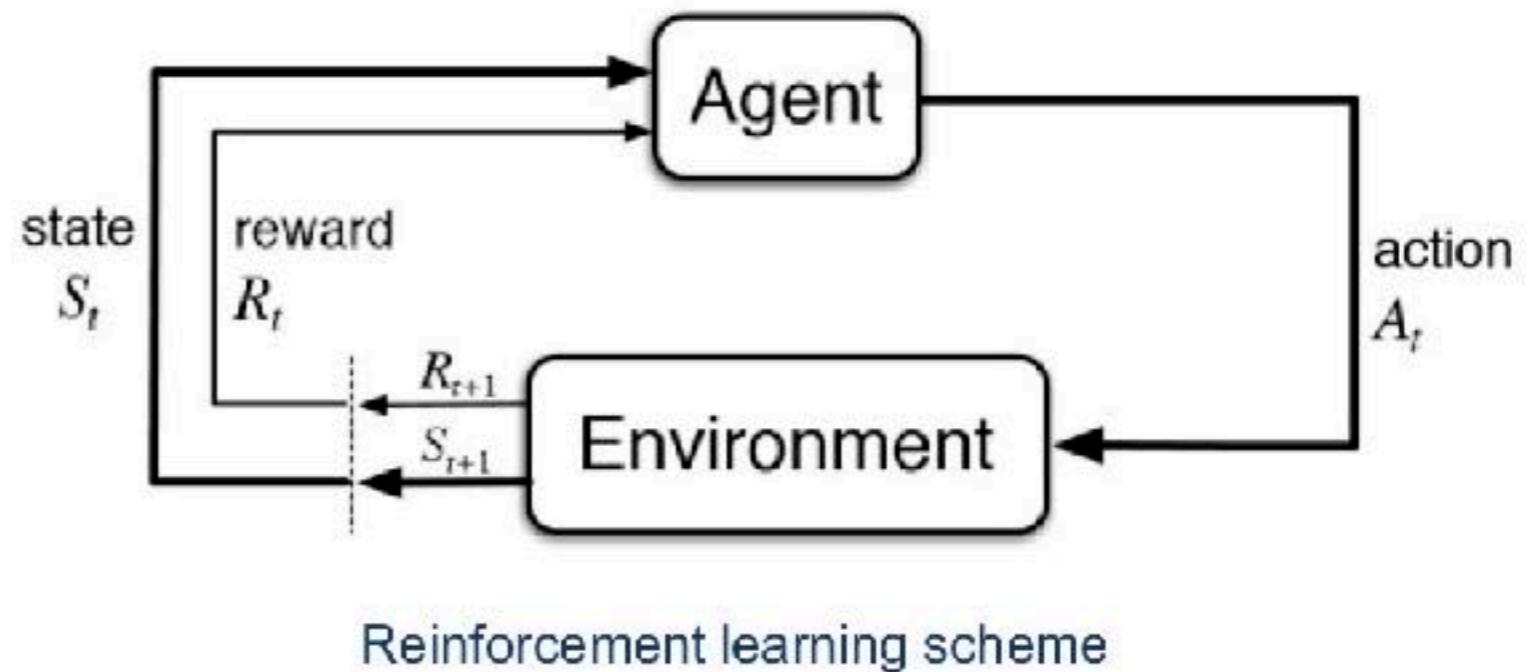
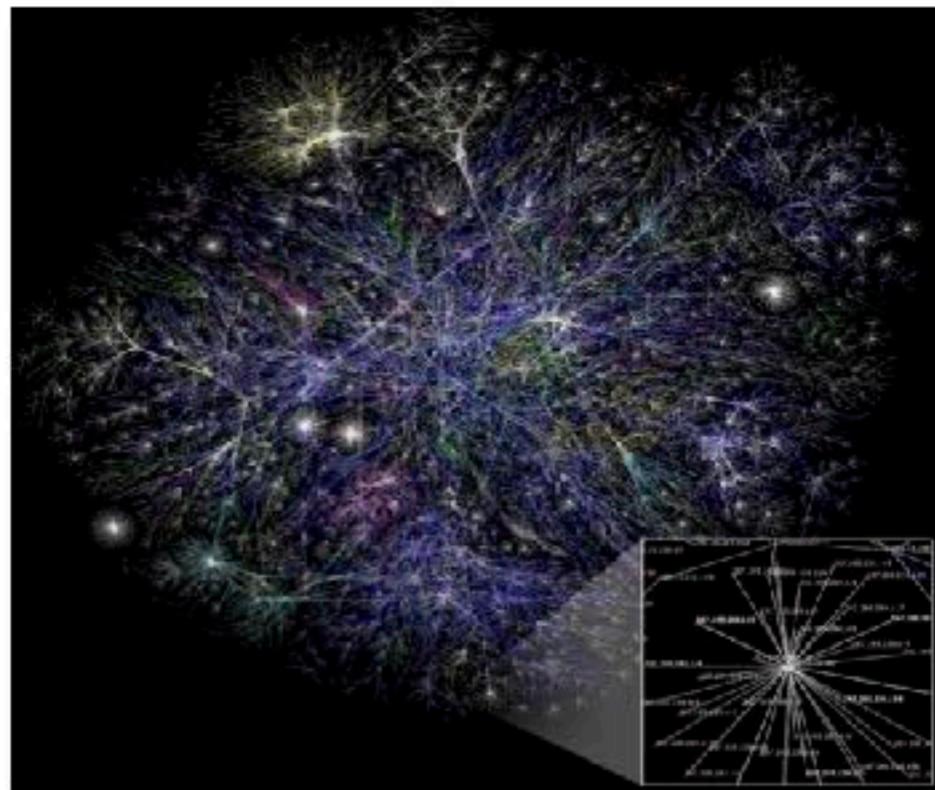
„Robotics in India” – Intelligent Robot project

by Bartłomiej Borzyszkowski

Welcome to Gradiet PG

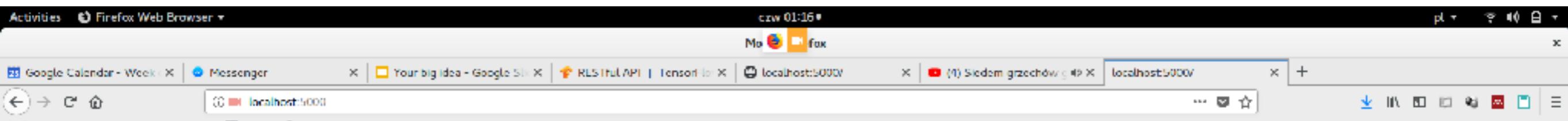
More details of the project will be described during one of our meetings within the Gradient PG Science Club – follow our website for more information.

I would like to invite you to participate in our community and work with the most exciting technologies of our century – artificial intelligence!



Paweł Kopeć



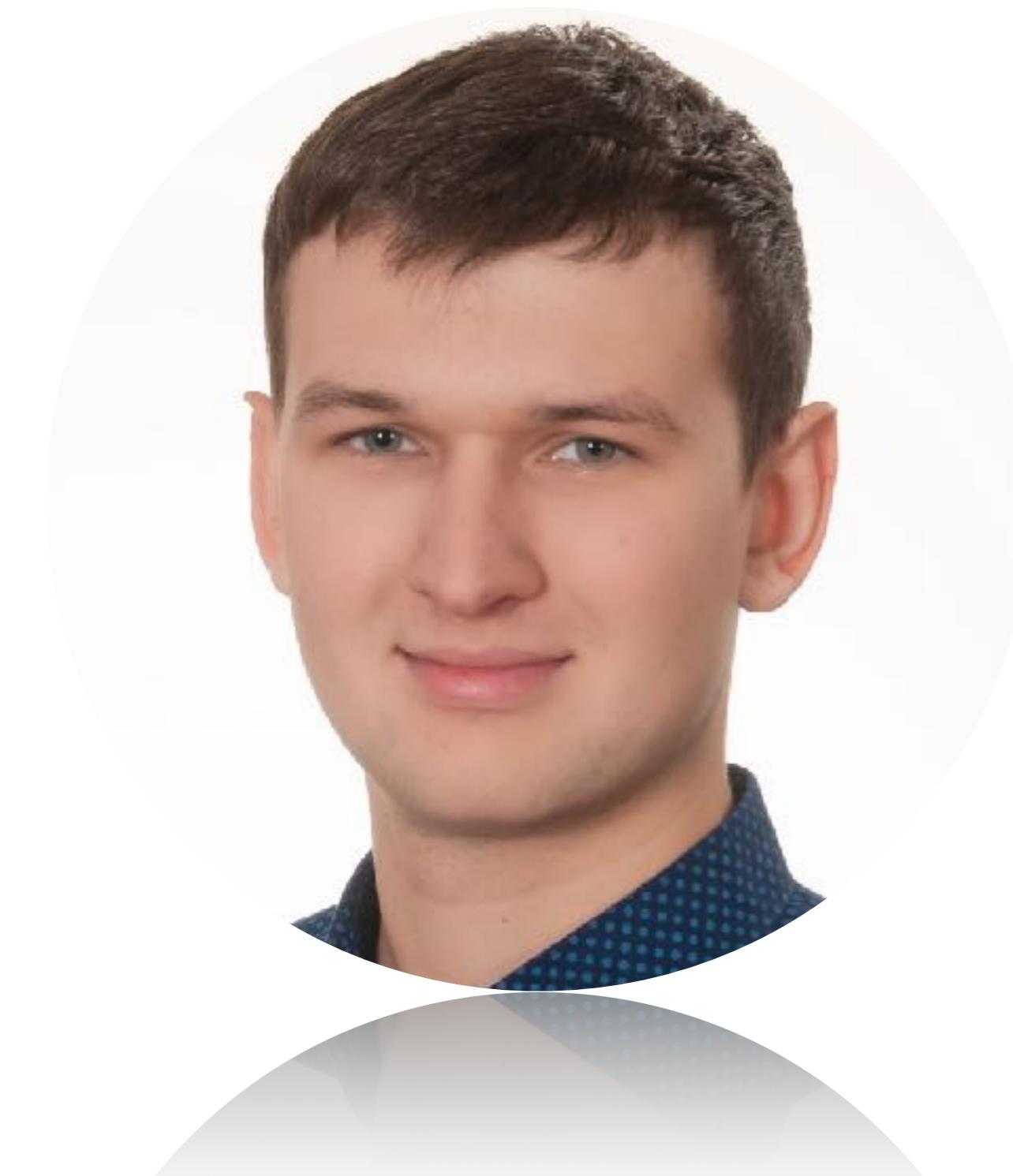


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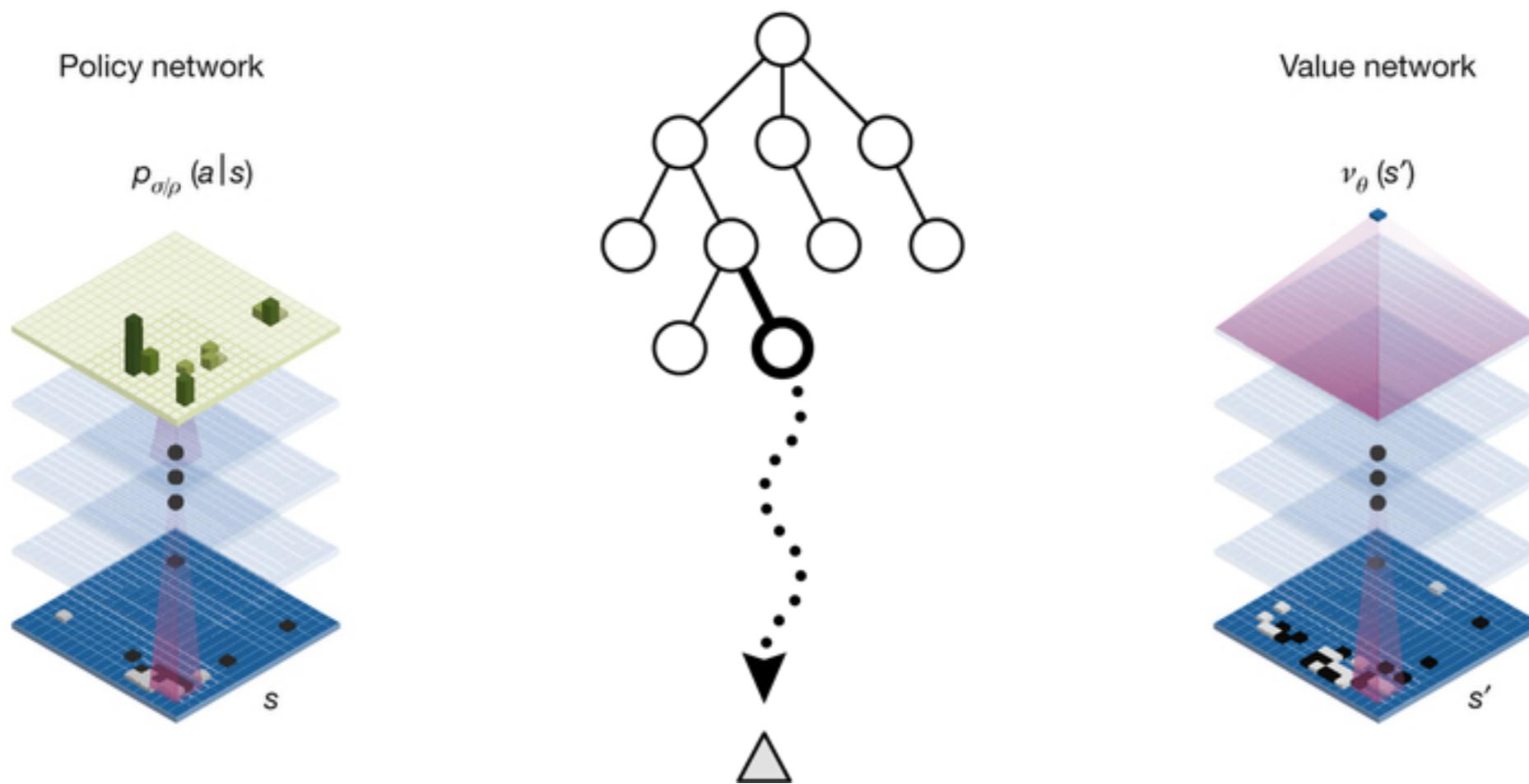
anger:
disgust:
fear:
happiness:
sadness:
surprise:
neutral:

F

Piotr Januszewski



Planning in Deep Reinforcement Learning

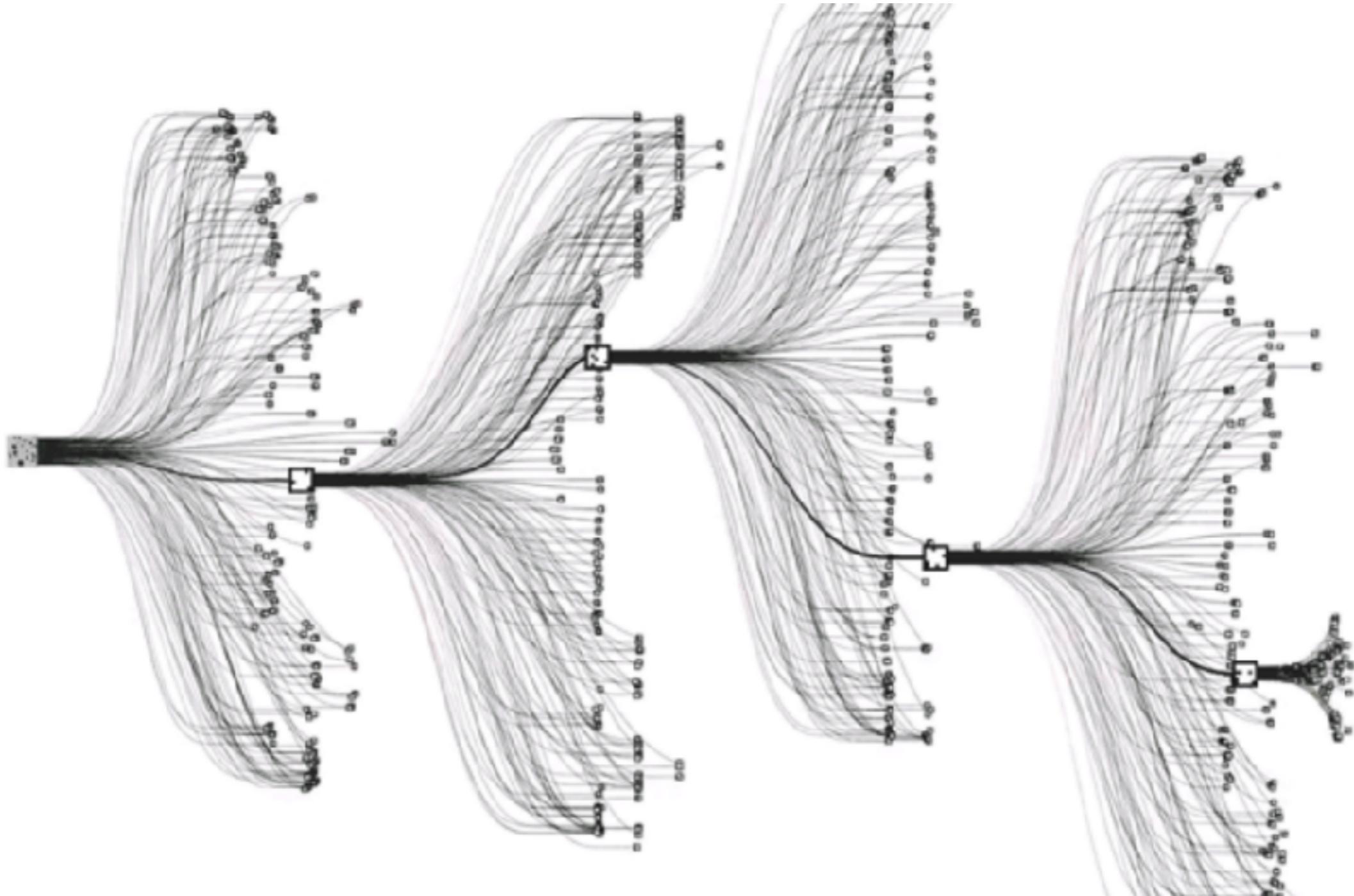


DeepMind's AlphaGo

AlphaGo Lee version of this algorithm became **the first AI to beat a human grandmaster of Go** in March of 2016.

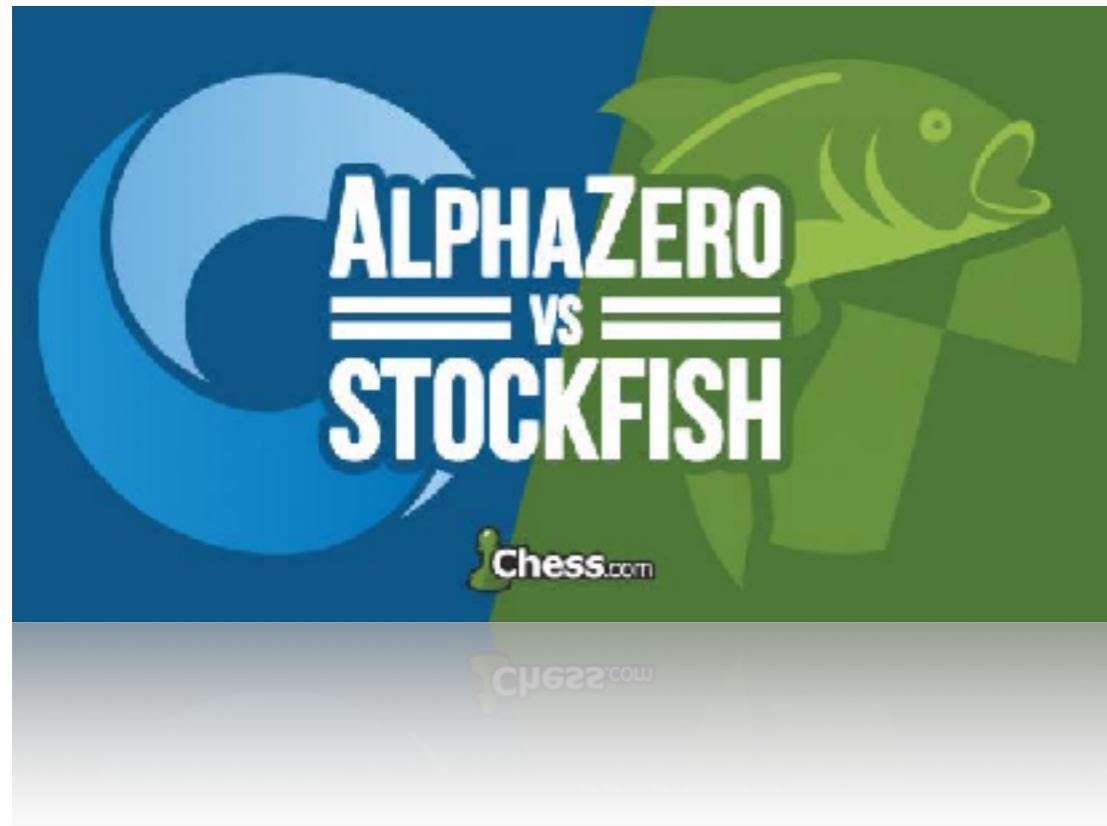
It is huge achievement as for a long time people thought that **Go is the holy grail of artificial intelligence** and we were still many years before AI will beat humans in this game!





The ancient Game of **Go** has more states then there are atoms in the known universe and it's branching factor is more then seven times bigger then the one of chess.

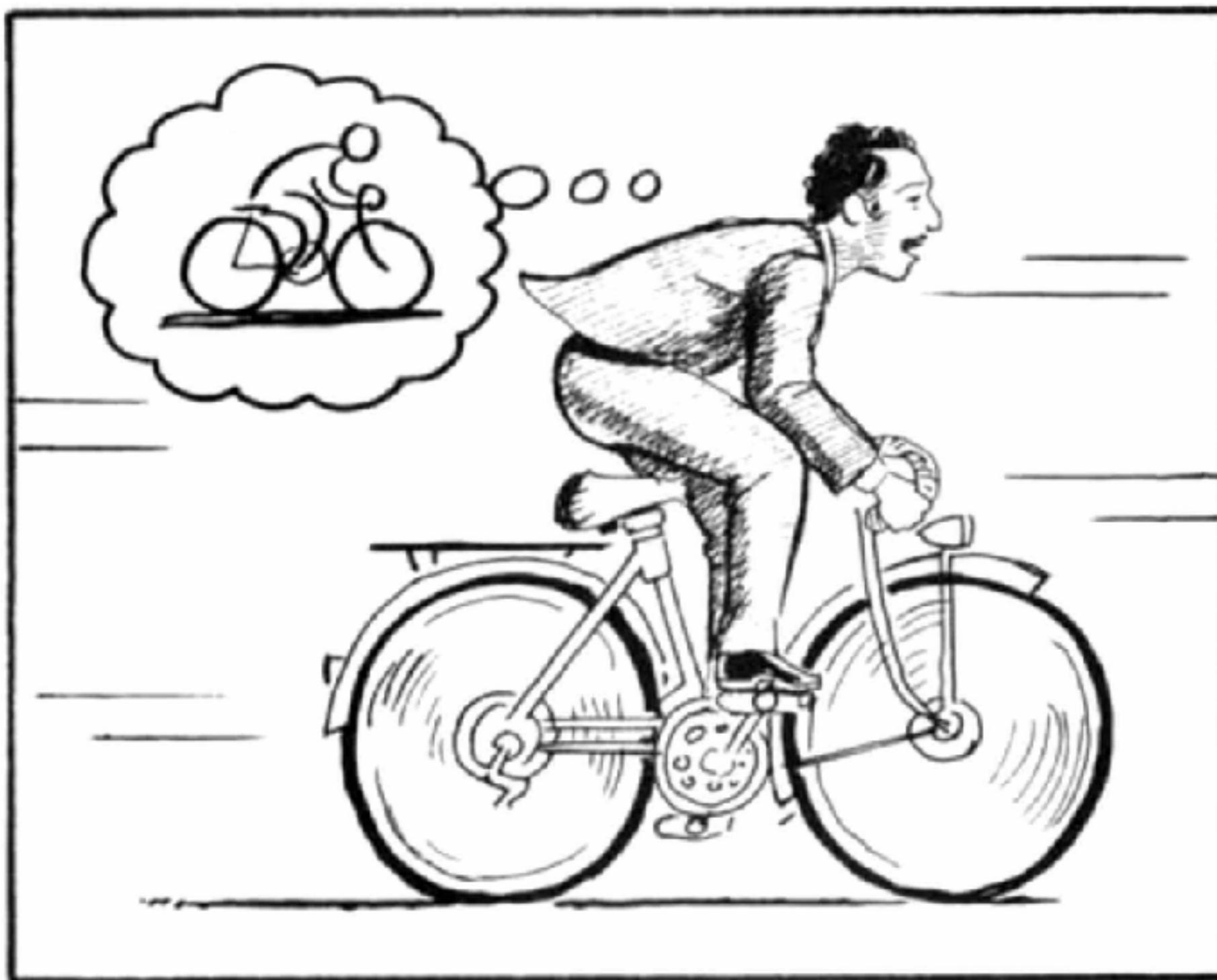
DeepMind's AlphaZero



In October of 2017, DeepMind published new AlphaGo version. **AlphaGo Zero had defeated AlphaGo 100–0**. Incredibly, it had done so **by learning solely through self-play**. No longer was a database of human expert games required to build a super-human AI.

48 days later they publish current state-of-the-art version AlphaZero, which can play other games like Chess and Shogi. **It can beat the world-champion programs StockFish (for Chess) and Elmo (for Shogi) learning through self-play for only about 4 and 2 hours respectively!**

Planning in imagination





Last but not least

Go to our website:

<http://gradient.eti.pg.gda.pl>

To join us send us
your application to

GradientPG@gmail.com

Questions?

Thank you and see
you later! 😊