

Jonáš Kulhánek

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EDUCATION

Charles University

MSC IN ARTIFICIAL INTELLIGENCE

Sep 2019 – Expected Jun 2021

Faculty of Mathematics and Physics

Cum. GPA: 4.00 / 4.00

Major GPA: 4.00 / 4.00

Czech Technical University

BSC IN COMPUTER SCIENCE

Jul 2016 – Jun 2019

Faculty of Electrical Engineering

Summa cum laude

Cum. GPA: 3.64 / 4.00

Major GPA: 3.74 / 4.00

Final exam grade: A

Sungkyunkwan University

Sep 2017 – Dec 2017

College of Sciences and Engineering

One semester visiting student

Cum. GPA: 4.00 / 4.00

LINKS

Github:// jkulhanek

LinkedIn:// jonaskulhanek

Google Scholar:// [Jonáš Kulhánek](#)

Research Gate:// [Jonas_Kulhanek](#)

TEACHING

Introduction to Artificial Intelligence

Teaching assistant | Summer 2020

zero-sum games, MCTS, A*, CSP, MDP,

EA, planning, knowledge representation

FEL, Czech Technical University

PROJECTS

Deep RL PyTorch

DRL, PyTorch, gym

Library for training DRL agents

github.com/jkulhanek/deep-rl-pytorch

LemmaTag

NLP, TensorFlow 2

Implementation of SoTA lemmatizer and tagger achieving 98.75% and 96.67% accuracies respectively on UD Treebank

github.com/jkulhanek/lemmatag

other projects at my webpage

LANGUAGES

English C1
French B1
Czech native

SELECTED EXPERIENCE

CIIRC | RESEARCHER

Jul 2019 – Now

- Visual navigation using deep reinforcement learning (DRL)
- Implementing SoTA DRL algorithms including **Rainbow**, **PAAC**, **AlphaZero**
- Publishing an open-source 3D environment simulator to train DRL agents
- Working with **Tomas Mikolov** on cellular automata applied on NLP
- Researching dialogue systems with pre-trained LMs (GPT2, BERT)
- Running large distributed GPU training
- Achieving **3rd place** in the DSTC9 dialogue state tracking shared task
- **PyTorch**, Slurm, Numpy, ROS, ...

TU DELFT | RESEARCHER

Jan 2019 – May 2019

- Visual navigation using deep reinforcement learning (DRL)
- Working under Prof. dr. **Robert Babuska** at 3me
- Publishing open-source DRL PyTorch library
- Evaluating navigation algorithms on real **mobile robots**
- **PyTorch**, TensorFlow, ROS, Numpy, ...

VALATRON | BACKEND DEVELOPER

Jun 2018 – Jan 2019

- Designing Node.js API backend and .NET Core backend
- Leading a team of developers
- Working on SPA frontend (React.js)
- Deploying applications built using Azure Functions
- Node.js, .NET Core, Azure Functions, React.js, ...

CENTER FOR MACHINE PERCEPTION | RESEARCHER

Feb 2018 – Jun 2018

- Building object detectors using fully convolutional neural networks
- Implementing RetinaNet, FasterRCNN, MaskNet (SoTA at that time)
- Preparing object detection datasets and data pipelines
- **TensorFlow**, Numpy, OpenCV, ...

complete list at <https://jkulhanek.github.io/#resume>.

PUBLICATIONS

Visual Navigation in Real-World Indoor Environments Using End-to-End Deep Reinforcement Learning

Oct 2020

Jonáš Kulhánek and Erik Derner and Robert Babuška,

Designing DRL agent with auxiliary tasks for real-world navigation. Transferring policy pretrained on custom 3D simulator to the real world.

submitted to ICRA/RA-L 2021

Vision-based navigation using Deep Reinforcement Learning

Sep 2019

Jonáš Kulhánek and Erik Derner and Tim de Bruin and Robert Babuška,

Extending PAAC with auxiliary tasks designed for visual navigation. Evaluating on AI2THOR, House3D, DeepMind Lab environments

2019 European Conference on Mobile Robots (ECMR), 2019, p.1-8

Visual Navigation using Deep Reinforcement Learning

May 2019

Jonáš Kulhánek,

Bachelor thesis