Jonáš Kulhánek

https://jkulhanek.github.io
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EDUCATION

Charles University
MSc in Artificial Intelligence
Sep 2019 – Jun 2021
Faculty of Mathematics and Physics
Summa cum laude
Cum. GPA: 4.00 / 4.00
Major GPA: 4.00 / 4.00
Final exam grade: A

Czech Technical University
BSc in Computer Science
Jun 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

Neural scene representation
CV, TensorFlow 2, PyTorch
Using DNNs to generate 3D environments from small sets of images

Deep RL PyTorch
DRL, PyTorch
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 on my webpage

SELECTED EXPERIENCE

CIIRC | junior researcher
Aug 2020 – 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 to NLP
- Researching dialogue systems with pre-trained LMs (GPT2, BERT)
- Running large distributed GPU training
- Achieving **3rd place** in the DSTC9 end-to-end multi-domain dialogue task
- **PyTorch**, Slurm, Numpy, ROS, …

CTU IN PRAGUE | teaching assistant
Jan 2020 – Jul 2020
- Teaching Introduction to Artificial Intelligence course

TU DELFT | research intern
Feb 2019 – Apr 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, …

CENTER FOR MACHINE PERCEPTION | research intern
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
Apr 2021
Jonáš Kulhánek and Erik Derner and Robert Babuška,
Designing DRL agent with auxiliary tasks for real-world navigation. Transfering policy pretrained on custom 3D simulator to the real world.
published in 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

AuGPT: Dialogue with Pre-trained Language Models and Data Augmentation
Feb 2021
Jonáš Kulhánek and Vojtěch Hudeček and Tomáš Nekvinda and Ondřej Dušek,
Using pre-trained GPT2 with extensive data augmentation.
submitted to SIGDIAL