Martin Matak

PhD Student at the University of Utah

https://martinmatak.github.io

EDUCATION

University of Utah, School of Computing (USA)

PhD in Computer Science — Aug 2019 – present

- Advised by Tucker Hermans

TU Wien (Austria)

MSc in Computational Intelligence / Logic and Computation — Oct 2016 – June 2019

- Advised by Georg Weissenbacher
- Thesis: *Attacks against Neural Networks* [PDF]
- Courses that were particularly interesting to me: *Machine Learning, Deep Learning in Visual Computing, Security in Machine Learning, Similarity Modeling, Introduction to NLP*

University of Zagreb, Faculty of Electrical Engineering and Computing (Croatia)

BSc in Computer Science — Sep 2013 – Jul 2016

- Thesis: *Data Processing with Technology Apache Spark*

PUBLICATIONS

- Martin Matak, Karl Van Wyk, Tucker Hermans, Dieter Fox
  "Smooth and Dexterous Grasping from Pointcloud Data using Geometric Fabrics"
  In preparation for RSS 2023
- Martin Matak and Tucker Hermans
  "Visual-Tactile Surface Estimation to Enable Multi-fingered, Precision Grasps"
  Under submission for RA-L 2022
- Rebecca Miles, Martin Matak, Mohanraj Devendran Shanthi, Darrin Young, Tucker Hermans
  "Comparing Piezoresistive Substrates for Tactile Sensing in Dexterous Hands" [PDF]
  Preprint
- Mark Van der Merwe, Qingkai Lu, Balakumar Sundaralingam, Martin Matak, Tucker Hermans
  "Learning Continuous 3D Reconstructions for Geometrically Aware Grasping" [PDF]
  IEEE International Conference on Robotics and Automation (ICRA) 2020

WORK EXPERIENCE

NVIDIA, Seattle, US

Research Scientist Intern at Seattle Robotics Lab — May 2022 – Dec 2022

- Working on Geometric Fabrics for Dexterous Grasping.

Deloitte Digital, Vienna, Austria

Analyst (Software developer) — May 2018 – July 2019

- Part of the team that developed a loyalty program for a client.

Austrian Institute of Technology (AIT), Vienna, Austria

Data Science Intern — Oct 2017 – Feb 2018

- Investigated linkability of *monero* cryptocurrency.

CROZ d.o.o., Zagreb, Croatia

Software Engineering Intern — Jul 2016 – Oct 2016

- Worked on graph search through natural language (Croatian).

University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia

Teaching assistant — Feb 2014 – July 2018

- Algorithms and Data Structures: Summer Semester (SS) '14, SS '15
- Introduction to Java Programming Language: SS '16, SS '18

SELECTED PROJECTS

Grasping Pipeline — Aug 2019 – now

- Generating grasps for a robot from only a partial view of the object. The project is under development.
- Tech stack: Python 2 and 3, ROS, PyTorch, C++
- Source: `https://bit.ly/3UfPDbE`

Adversarial Perturbations Against Deep Neural Networks — Jul 2018 – Apr 2019

- Trained several classifiers for human age estimation from the given image. Evaluated several white-box and black-box attacks against the classifiers. Developed a new black-box attack based on the existing state of the art algorithm. Some adversarial samples successfully tricked Microsoft service for age estimation.
- Tech stack: Tensorflow, Keras, and Python 3
- Source: `https://github.com/martinmatak/adversarial-framework`

Monero Linkability — Oct 2017 – Feb 2018

- This project is implementation of the paper: An Empirical Analysis of Linkability in the Monero Blockchain.
- Tech stack: Scala, Spark, and Google Cloud
- Source: `https://github.com/martinmatak/monero-linkability`

Neural Bird — Sep 2015 – Jan 2016

- Five of us developed a harder version of flappy bird and trained the agent (a neural network) to play better than human. My part was developing a neural network from scratch. More info about the project: `http://morgoth.zemris.fer.hr/data-repo/proj/1/`.
- Tech stack: Java
- Source: `https://github.com/martinmatak/NeuralBird`

ACHIEVEMENTS

Java	Part of a team where three of us won Code Quest - programming contest http://croz.net/news/odrzan-5-croz-code-quest
Learning skills	One of the two students in generation who received a *scolarship for outstanding students* (http://logic-cs.at/master/grants-and-scholarships/).

ACADEMIC SERVICE

Reviewer for IROS 2021 and ICRA 2022.