Dr. HEUNA KIM

Email: heynaheyna9@gmail.com Webpage: http://hahey.github.io Github: http://github.com/hahey

WORKING EXPERIENCE

2018–1 – now **Deep Learning Researcher**, Haezoom Europe GmbH.

Satellite "Chollian 2" for short-term Solar Power Forecasting, in progress

- as a **team lead**, supervised the algorithm research team and collaborated to develop (1) clear sky image compositionis, (2) cloud motion tracking using optical flow, (3) microdust and snow detection algorithms
- designed the architecture and implemented the satellite image processing module for Chollian 2

Wind Power Forecasting

- **Award**: won 4th place for the wind power forecasting competition 2019 by Korea Power Exchange (KPX)
- implemented a high-precision wind power forecasting model in a single month using wind farm data and numerical weather prediction (NWP) data
- applied the hybrid model combining statistical models and physical models
- improved the accuracy using bias corrections, ensemble over forecast horizon, power curve fitting with perturbation and variational methods

3D-Building Reconstruction Prototype using Satellite Images for Shadow Simulation

- extracted the height information from 2D-Satellite images by applying super resolution, stereo vision, deblurring, and depth estimation
- Used SNAP for Satellite "Sentinel 2" and Botos for Satellite "Landsat 8", QGIS, ImageMagick, Raster images

Cloud Detection and Cloud Motion Estimation

- researched and developed the cloud detection and cloud motion estimation algorithms by using CNN (Convolutional Neural Network), optical flow, transmittance simulators (RTTOV, 6S) and satellite "Himawari 8"

2016–12 – 2017–11 **Deep Learning Researcher**, Twenty Billion Neurons GmbH.

Realtime Common Sense Recognition

- **published** at ICCV 2017
- improved the online RNN (Recurrent Neural Network) model from 5% to 65%, eventually 85% with more data and implemented with Tensorflow
- the model was capable of understanding temporal-relevant common sense, that 2D-image object detection models failed to recognize

Neural Network for Video Captioning and Temporal Action Localization by Collaborating with Toronto Team using Tensorflow and Pytorch

Realtime Video Understanding Demo Infrastructure in Python

- designed and implemented a demo program that supports camera streaming, network communication, and multiprocessing
- used OpenCV, PiCamera, PyGame, ImageIO for RaspberryPi, Jetson board
- used Multiprocessing, ZMQ, Socket, PyBuilder, Travis CI

EDUCATION

2013-6 – 2016-6 **Ph.D.** Mathematics and Computer Science (Magna Cum Laude)
Freie Universität Berlin (FU Berlin), Germany

Awards
- Scholarship from German Research Foundation (Methods for Discrete Structures)
- See the webpage for **publications** including **7 reviewed** and **3 weakly reviewed** papers.

2011-2 – 2013-2 **M.S.** Computer Science (GPA: 4.25/4.30)
Korea Advanced Institute of Science and Technology (KAIST), S. Korea

Awards
- Best Poster Award for Master Thesis
- National Research Scholarship from Korea Scholarship Fund

2004-3 – 2008-2 **B.S.** Mathematics, Minor in Physics (GPA: 3.57/4.30)
Pohang University of Science and Technology (POSTECH), S. Korea

Awards
- Honorable Scholarship from the President of Korea
- Honorable Scholarship from Korea Foundation for Advanced Studies
- Silver Medal from National Collegiate Programming Competition
- Winner of Software Security Team Competition between POSTECH & KAIST

SKILLS

Programming	Proficient: Python, LaTex, SQL (PostgreSQL, MySQL, SQLite, and DB theory) Intermediate: Java, Haskell, R Basic: C++/C
Frameworks	Tensorflow, PyTorch, OpenCV, Hadoop
Methodologies	TDD, CI/CD (Travis CI, Jenkins, Docker), Agile (Scrum, Kanban, also as a moderator)
Environments	Proficient: Linux, Git, Intermediate: CUDA, cuDNN, JetPack
Language	English (IBT 105/120, Nov. 2012), German (C1), Korean (Native)

VOLUNTEER TEACHING

Summer 2019 – now	Teacher at Redi-school (Non-profit Organization for Refugees and more) Course: Python for Data Analysis
Summer 2015	Students Supervision for Their Master Theses
Summer 2014	Teacher at FU Berlin, Course: Experiencing Theoretical Computer Science with Origami

OPEN SOURCE PROJECTS

Summer 2019	django-migration-vis: Django command tool for visualizing migration graphs
Summer 2017	GulpIO: binary storage format for deep learning on videos