Taehoon Kim

https://carpedm20.github.io/

EDUCATION

Ulsan National Institute of Science and Technology (UNIST) Mar 2011 – Aug 2015

- B.S. in Computer Science and Engineering
- Graduated with Outstanding Graduate Award (ranked 1st out of 509 undergraduates)

HONORS & AWARDS

Best Paper Award, International Conference on Big Data Intelligence and Computing (DataCom) 2015
AI Grant Fellowship ($2,500 cash + $20,000 credit as award), 2018
Outstanding Graduate Award, UNIST, 2015
Dean's List, UNIST, 2013, 2014
Finalist, International Student Cluster Challenge, International Conference on Supercomputing (ICS), 2014
Finalist, Asia student Supercomputing Challenge (ASC), 2014
Finalist, Korea Whitehat Hacking Competition, 2014
3rd place ($ 8,000 as awards), Korea Whitehat Hacking Competition, 2013
1st place ($ 1,000 as awards), The Catholic University of Korea Hacking Competition, 2013
Finalist, Asia student Supercomputing Challenge (ASC), 2013

SCHOLARSHIP

Academic Performance Scholarship, UNIST, 2011 – 2015
Global Scholarship for Undergraduate Research Opportunities Program (UROP), UNIST, 2015
National Science and Technology Scholarship, Korean Student Aid Foundation, 2013

PUBLICATIONS

[6] H. Noh, T. Kim, J. Mun and B. Han, Zero-shot Visual Question Answering, Submitted, 2018

[5] T. Kim†, Y. Lee† and J. Lim, Teaching Machines to Understand Visual Manuals via Attention Supervision for Object Assembly, Submitted, 2018

[4] T. Kim, J. Choi, D. Lee, A. Sim, C. A. Spurlock, A. Todd, K. Wu, Predicting Baseline for Analysis of Electricity Pricing, In *International Journal of Big Data Intelligence* (**IJBDI**), 2016

[3] J. Lee, K. Lee, C. Han, T. Kim, and S. Chong, Resource-efficient Mobile Multimedia Streaming with Adaptive Network Selection, In *IEEE Transactions on Multimedia*, 2016

[2] T. Kim and J. Choi, Reading documents for bayesian Online Change Point Detection, In *Empirical Methods in Natural Language Processing* (**EMNLP**), 2015

[1] T. Kim, D. Lee, J. Choi, A. Spurlock, A. Sim, A. Todd, K. Wu, Extracting Baseline Electricity Usage Using Gradient Tree Boosting, In *International Conference on Big Data Intelligence and Computing* (**DataCom**), 2015, **Best Paper Award**

RESEARCH EXPERIENCE

OpenAI, San Francisco, USA Sep 2018 – Present
Machine Learning Engineer

- Sample-efficient Reinforcement Learning via Semi-supervised Learning.

Cognitive Learning for Vision and Robotics Lab, USC, Los Angeles, USA Jan 2017 – Present
Visiting Researcher (Advisor: Prof. Joseph J. Lim)

- Developed attention-based agents which are guided by step-by-step visual instructions to solve hierarchical tasks such as assembling IKEA furniture. Trained agents with self-supervision and semi-supervised learning to achieve generalization of unseen shapes and colors [5].

Lawrence Berkeley National Laboratory, Berkeley, USA Jul 2015 – Aug 2015
Research Intern (Advisors: John Wu, Alex Sim)

- Developed baseline models of electricity usage data to find reference usage patterns for different household groups. Used gradient boosting algorithm to capture differences of daily peak usages between groups and analyzed baseline of each group by controlling highly correlated features [1, 4].

Statistical Artificial Intelligence Lab, UNIST, South Korea Sep 2014 – Sep 2015
Research Intern (Advisor: Prof. Jaesik Choi)

- Improved Bayesian changepoint detection models by incorporating external information implicitly written in texts. Incorporated documents as a conditional variable of changepoint prior so that model learns a generative model of texts which represents a relation between textual features and change of data [2].

Mobile Smart Networking Laboratory, UNIST Jan 2013 – Aug 2014
Research Intern (Advisor: Prof. Kyunghan Lee)
- Implemented algorithm for mobile video streaming with context-aware scheduling and caching [3].

INDUSTRY EXPERIENCE

Devsisters, Seoul, South Korea Apr 2016 – Aug 2018
Research Engineer
- Developed framework for automatic game balancing with deep reinforcement learning including Double Q-learning, Dueling Network, and Prioritized Replay Memory.
- Implemented generative adversarial networks and multi-speaker speech synthesis models.
- Worked as a substitute for mandatory military service.

Vingle, Seoul, South Korea
Software Engineer Oct 2015 – Apr 2016
- Developed system for personal push notification and statistical data visualization of user retention.
- Worked as a substitute for mandatory military service.

Moloco, California, USA Oct 2014 – Jan 2015
Software Engineering Intern
- Implemented prediction models that target advertisements of mobile application based on purchase history.
- Developed online data visualization with a large-scale database using cache and query optimization.

NAVER Labs, Seoul, South Korea Jul 2014 – Aug 2014
Software Engineering Intern
- Developed front-end and back-end of web application for cloud comments.

TALKS

DEVIEW 2016 & **2017**, Seoul, South Korea 2016, 2017
- Multi-Speaker Speech Synthesis with Attention-Based Deep Learning.
- How to build a Framework for Automatic Game Balancing with Deep Reinforcement Learning.

NAVER Clova AI 2017 & 2018, Seoul, South Korea 2017
- Recent Advancement of Deep Reinforcement Learning from Multi-Agent to Meta-Learning.

PyCon APAC 2016, Seoul, South Korea 2016
- Deep Convolutional GAN, Neural Turing Machine, Deep Q-learning and Visual Analogy.

TensorFlow Korea, Seoul, South Korea 2016
- End-to-End Memory Network and Asynchronous Advantageous Actor-Critic method.

LEADERSHIP

President of Computer Security Club, UNIST 2012 – 2013
- Led teams for domestic and international hacking competitions ($ 9,000 as total awards).
- Participated in 3 international supercomputing challenges (3 Finalist awards).
- Reported vulnerabilities on 3 commercial mobile and web services.

PROJECTS

GENERATIVE

Deep Convolutional GAN (★ **4.5k+**[*]) Jan 2016
Implemented Deep Convolutional Generative Adversarial Networks (Radford et, al. 2015) and web demo with *convnet.js*
The code is referenced in more than 25 papers including:
- Improved Techniques for Training GANs (Salimans et, al. 2016) from OpenAI
- Least Squares Generative Adversarial Networks (Mao et, al. 2016)
- Semi-supervised learning with generative adversarial networks (Odena et, al 2016)

Boundary Equilibrium GAN (★ 600+) Apr 2017
Implemented BEGAN: Boundary Equilibrium Generative Adversarial Networks (Berthelot et, al. 2017)
The code is used in the following papers:
- GANs Trained by a Two Time-Scale Update Rule Converge to a Nash Equilibrium (Heusel et, al 2017)
- MAGAN: Margin Adaptation for Generative Adversarial Networks (Wang et, al. 2017)

Multi-Speaker Speech Synthesis (★ 200+) Oct 2017
Implemented Deep Voice 2: Multi-Speaker Neural Text-to-Speech (Berthelot et, al. 2017)

[*]The number of stars a repository has on github.com/carpedm20

Discovering Cross-Domain GAN (★ 700+) Mar 2017
Implemented Learning to Discover Cross-Domain Relations with Generative Adversarial Networks (Kim et, al. 2017)

Simulated+Unsupervised Learning GAN (★ 400+) Jan 2017
Implemented Learning from Simulated and Unsupervised Images through Adversarial Training (Shrivastava et, al. 2016)

Pixel Recurrent Neural Networks (★ 300+) Jul 2016
Implemented Pixel Recurrent Neural Networks (Oord et, al. 2016)

Deep Visual Analogy-Making (★ 200+) Feb 2016
Implemented Deep Visual Analogy-Making (Reed et, al. 2015)

PROGRAM INDUCTION

Reinforcement Learning Program Synthesis Dec 2017
Implemented Leveraging Grammar and Reinforcement Learning for Neural Program Synthesis (Under review, 2017)

Pointer Network (★ 200+) Jan 2017
Implemented Pointer Networks (Vinyals et, al. 2015)

Neural Turing Machine (★ 800+) Dec 2015
Implemented Neural Turing Machine (Graves et, al. 2014)

RL

Synthesizing Programs for Images using Reinforced Adversarial Learning Apr 2018
Implemented Synthesizing Programs for Images using Reinforced Adversarial Learning (Ganin et, al. 2018)

Efficient Neural Architecture Search via Parameters Sharing (★ 800+) Feb 2018
Implemented Efficient Neural Architecture Search via Parameters Sharing (Pham et, al. 2018)

Normalized Advantage Functions (★ 100+) Jul 2016
Implemented Continuous Deep Q-Learning with Model-based Acceleration Learning (Gu et, al. 2016)

Dueling Double Q-Learning (★ **1.3k+**) Jul 2016
Implemented Dueling Network Architectures for Deep Reinforcement Learning (Wang et, al. 2015)

Deep Q-Network (★ **1.6k+**) Jun 2016
Implemented Human-Level Control through Deep Reinforcement Learning (Vinyals et, al. 2015)

Asynchronous Advantageous Actor-Critic Jun 2016
Implemented Asynchronous Methods for Deep Reinforcement Learning (Mnih et, al. 2016)

NLP

Neural Variational Inference for Text Processing (★ 400+) May 2016
Implemented Neural Variational Inference for Text Processing (Miao et, al. 2015)
The code is used in the following papers:
- Autoencoding Variational Inference For Topic Models (Srivastava et, al. 2017)
- Neural Variational Inference For Topic Models (Srivastava et, al. 2016)

Character-Aware Neural Language Models (★ 500+) Feb 2016
Implemented Character-Aware Neural Language Models (Kim et, al. 2016)

End-To-End Memory Networks (★ 600+) Dec 2015
Implemented End-To-End Memory Networks (Sukhbaatar et, al. 2015)

REFERENCES

Joseph J. Lim
Assistant Professor
Department of Computer Science
University of Southern California
Email: lim@csail.mit.edu

John Wu
Group Leader
Scientific Data Management Group
Lawrence Berkeley National Laboratory
Email: kwu@lbl.gov

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