Taehoon Kim

https://carpedm20.github.io/

INTERESTS

Reasoning, Program Induction, Reinforcement Learning (RL)

EDUCATION

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

- B.S. in Computer Science and Engineering
- *Cumulative GPA: 3.73 / 4.30 (Magna Cum Laude)*
- 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
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

[5] T. Kim†, Y. Lee† and J. Lim, Teaching Machines to Understand Visual Manuals via Attention Supervision for Object Assembly, Work in progress, 2017

[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

University of Southern California, Los Angeles, USA Jan 2017 – Present
Visiting Researcher (Advisor: Prof. Joseph J. Lim)

- Proposed attention-based agents guided by step-by-step visual instructions to solve hierarchical tasks [5].
- Studied learning to execute sequences of visual instructions to solve sequential tasks.

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

- Proposed baseline usage models for each household to cluster the households into different groups [4].
- Identified energy usage patterns and cluster actions of households through gradient boosted trees [1].

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

- Proposed Bayesian model conditioned on text to predict change points in time series data [2].
- Gave poster presentation on [2] at *Empirical Methods in Natural Language Processing* (EMNLP) 2015.

Mobile Smart Networking Laboratory, UNIST Jan 2013 – Aug 2014
Research Intern (Advisor: Prof. Kyunghan Lee)

- Developed algorithm for optimized mobile video streaming with context-aware scheduling and caching [3].

INDUSTRY EXPERIENCE

Devsisters, Seoul, South Korea — Apr 2016 – Present
Research Engineer
- Developed automatic game balancing framework with Double Q-learning, Dueling network, Prioritized replay memory and used prediction on beneficial and dangerous events as intrinsic rewards.
- Implemented generative models including BEGAN and multi-speaker speech synthesis models like Tacotron.
- Worked as a substitute of mandatory military duty.

Vingle, Seoul, South Korea
Software Engineer — Oct 2015 – Apr 2016
- Developed a personal push notification system and a statistical data visualization for user retention.
- Developed a prediction model for age and gender from mobile app usage pattern.
- Work as a substitute of mandatory military duty.

Moloco, California, USA — Oct 2014 – Jan 2015
Software Engineering Intern
- Implemented maximum-likelihood estimation model of the number of users who will download an application.
- Developed web visualization of models from a large-scale database with query optimization and cache system.

NAVER Labs, Seoul, South Korea — Jul 2014 – Aug 2014
Software Engineering Intern
- Developed front-end and back-end of cloud comment hosting service.

TALKS

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

NAVER Clova, 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 domestic and international hacking competitions ($ 9,000 as total awards).
- Participated 3 international supercomputing challenges (3 Finalist awards).
- Reported vulnerabilities on 3 commercial mobile and web services.

PROJECTS

GENERATIVE

DCGAN in TensorFlow (★ **3.1k+**[*]) — Jan 2016
Implemented Deep Convolutional Generative Adversarial Networks (Radford et, al. 2015)
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)

BEGAN in TensorFlow (★ 500+) — Apr 2017
Implemented BEGAN: Boundary Equilibrium Generative Adversarial Networks (Berthelot et, al. 2017)
The code is used in 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 in TensorFlow — Oct 2017
Implemented Deep Voice 2: Multi-Speaker Neural Text-to-Speech (Berthelot et, al. 2017) in TensorFlow

BEGAN in PyTorch (★ 200+) — Apr 2017
Implemented BEGAN: Boundary Equilibrium Generative Adversarial Networks (Berthelot et, al. 2017) in PyTorch

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

DiscoGAN in PyTorch (★ 500+) Mar 2017
Implemented Learning to Discover Cross-Domain Relations with Generative Adversarial Networks (Kim et, al. 2017)

Simulated+Unsupervised learning in TensorFlow (★ 300+) 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 in TensorFlow (★ 200+) Feb 2016
Implemented Deep Visual Analogy-Making (Reed et, al. 2015)

Neural Face Jan 2016
A web application that generates Asian face images with DCGAN-tensorflow and convnet.js

RL

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

Dueling Network in TensorFlow (★ **1k+**) Jul 2016
Implemented Dueling Network Architectures for Deep Reinforcement Learning (Wang et, al. 2015)

Deep Q-network in TensorFlow (★ **1.3k+**) Jun 2016
Implemented Deep Q-Network (Vinyals et, al. 2015) in TensorFlow

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

NLP

Neural Variational Inference for Text Processing in TensorFlow (★ 400+) May 2016
Implemented Neural Variational Inference for Text Processing (Miao et, al. 2015)
The code is used in 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 in TensorFlow (★ 500+) Feb 2016
Implemented Character-Aware Neural Language Models (Kim et, al. 2016)

End-To-End Memory Networks in TensorFlow (★ 500+) Dec 2015
Implemented End-To-End Memory Networks (Sukhbaatar et, al. 2015)

ETC

Pointer Network in TensorFlow (★ 100+) Jan 2017
Implemented Learning to Discover Cross-Domain Relations with Generative Adversarial Networks (Kim et, al. 2015)

Neural Turing Machine in TensorFlow (★ 700+) Dec 2015
Implemented Neural Turing Machine (Graves et, al. 2014) in TensorFlow

Reverse Engineering, *LINE, KakaoTalk, Between, Ndrive, and Korail* (★ 600+) Aug 2014
Reverse engineered 5 commercial services including 2 mobile messengers, LINE and KakaoTalk and wrote python libraries

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

Jaesik Choi
Associate Professor
School of Electrical and Computer Engineering
Ulsan National Institute of Science and Technology
Email: jaesik@unist.ac.kr

Alex Sim
Senior Computing Engineer
Scientific Data Management Group
Lawrence Berkeley National Laboratory
Email: asim@lbl.gov