Chaeyoung Lee

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EDUCATION

Stanford University — Palo Alto, CA
Ph.D. in Computer Science — 2023 - Present

Yale University — New Haven, CT
B.S. in Electrical Engineering & Computer Science (GPA: 3.91/4.00) — 2019 - 2023

RESEARCH EXPERIENCES

Stanford Smart Sensing Systems Lab & Novel Computing Systems Lab — Palo Alto, CA
Graduate Researcher (Co-Advisor: Prof. Zerina Kapetanovic & Prof. Sara Achour) — Sep 2023 - Present

- Exploring battery-powered intelligence for embedded systems based on tiny ML and Hyperdimensional Computing (HDC).
- Building and end-to-end robotics system for agriculture with the focus on low-energy and wireless mesh networks.

Yale Efficient Computing Lab — New Haven, CT
Researcher (Advisor: Prof. Lin Zhong) — Jan 2022 - Jan 2023

- Developed a 5G physical layer on the cloud using Massive MIMO technology to support up to 2 Gbps of throughput and 5 ms of latency.
- Designed an algorithm to dynamically allocate compute resources (CPUs, FPGAs) based on network traffic, decreasing deployment cost by 25%. Used C++, Rust, and Verilog.

Yale Center for Research Computing — New Haven, CT
Researcher (Advisor: Dr. Rob Bjornson) — Dec 2019 - May 2020

- Devised a workaround to do serverless batch processing on GCP (before Google supported Cloud Batch) with a custom pipeline using Nextflow, Slurm, and Google Life Sciences API and wrote a tutorial.
- Developed pipelines in Nextflow for high throughput bioinformatics applications such as genome alignment and variant calling for Yale researchers.

Yale Peabody Museum of Natural History — New Haven, CT
Researcher (Advisor: Prof. David Skelly) — Sep 2019 – May 2020

- Built an automated photo acquisition process where the camera takes multi-view images of a jar as it is rotated by a pan. The computer retrieves the image in real-time and reconstructs the label.
- Developed a novel label reconstruction algorithm using text recognition, multiple sequence alignment, and lexicons and achieved 87% retrieval accuracy and 1 second latency. Our method outperforms the conventional method using photogrammetry (82% accuracy, 30 minutes duration).

WORK EXPERIENCES

Apple — Cupertino, CA
Machine Learning Engineering Intern — Jun 2020 - Aug 2020; Jun 2021 - Aug 2021

- Built a neural network-based speech synthesis model for Siri that can produce voices of multiple speakers in multiple styles.
- My models outperformed production models shipped in iOS 14 in the Mean Opinion Score evaluation.

Upstage AI — Seongnam, South Korea
Data Engineer — Nov 2020 - May 2021

- Built a pipeline to produce training data for machine learning models and supervised 30 annotators in producing 130K data samples.

- Designed an algorithm to automatically filter low-quality data and developed a machine learning model to annotate partially labeled data, increasing dataset size by 50%.

Naver   Seongnam, South Korea
Machine Learning Engineering Intern   Jan 2019 - Jul 2019

- Published original research on new evaluation metrics for text detection models in 2 mainstream machine learning conference workshops (CVPR'19, ICDAR'19) as the lead author.

PUBLICATIONS

Inferential Statistics-Based Early Termination for Hyperdimensional Computing
L. Yi, Y. Yang, *Chae Young Lee*, and S. Achour
Submitted to ASPLOS 2025

HyperCam: Low-power Onboard Computer Vision for IoT Cameras
Chae Young Lee, M. Fite, T. Rao, L. Yi, S. Achour, and Z. Kapetanovic
Submitted to MobiCom 2024

CLEval: Character-Level Evaluation for Text Detection and Recognition Tasks
Y. Baek, D. Nam, S. Park, J. Lee, S. Shin, J. Baek, *Chae Young Lee*, and H. Lee
CVPR Text and Documents in the Deep Learning Era Workshop 2020

TedEval: A Fair Evaluation Metric for Scene Text Detectors
Chae Young Lee, Y. Baek, and H. Lee
ICDAR Workshop on Industrial Applications of Document Analysis and Recognition 2019

Diagnosis Method and Apparatus for Neurodegenerative Diseases Based on Deep Learning Network
Chae Young Lee
Korea Patent (KR 1019363020000) 2019

Conditional WaveGAN
Chae Young Lee, A. Toffy, G. Jung, and W. Han
TensorFlow Korea Conference 2018

TEACHING

2024	Course Planner, *Embedded Systems*, Stanford University
2022	TA, *Introduction to Electronics*, Yale University
2022	TA, *Deep Learning Theory and Applications*, Yale University
2021	TA, *Systems Programming and Computer Organization*, Yale University
2020	TA, *Data Structures and Programming Techniques*, Yale University

AWARDS

2023	School of Engineering Fellowship, Stanford University
2023	Mellon Grant Fellowship, Yale University
2018	1st, Bio Startup Challenge, Korea Health Industry Development Institute
2018	3rd, The EU Contest for Young Scientists, European Union