

DoangJoo "Alan" Synn

PhD Candidate in Computer Science · Georgia Institute of Technology
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Research Interests

I study **motion** as a computational medium across HCI and computer graphics. My research builds systems for designing, generating, and fabricating motion. I aim to make motion programmable and tangible across animated characters, mechanical artifacts, robotic systems, and AI-assisted creative tools.

Before starting my Ph.D., I spent eight years building software systems across AI systems, games, cloud platforms, and social robots.

Education

Georgia Tech, Ph.D. in Computer Science

2022 – Present

- Atlanta, GA, USA
- School of Interactive Computing; advised by Profs. Oh & Ha
- Research: computational design, automata, and motion synthesis (Graphics/HCI)

Korea University, M.Eng. in ECE

2020 – 2022

- Seoul, Korea
- Advised by Prof. Jong-Kook Kim
- GPA: 4.25 (4.5 scale)
- Thesis: *On Efficient Data Delivery for Machine Learning Systems*

Korea University, B.Eng. in EE

2012 – 2020

- Seoul, Korea
- GPA: 3.56 (4.5 scale)
- On leave from 2016 Spring to 2019 Spring to serve alternative military service

Professional Experience

PhD Research Intern, Dolby Laboratories

2024 – 2025

- Atlanta, GA, USA
- Experience Delivery Lab, built a time-series, multimodal datastore supporting low-latency media analytics.

MLOps Engineering Intern, LG Uplus Corp.

2023

- Seoul, Korea
- Led **DeepCrunch**, a model-compression library with multi-backend AI inference for efficient edge serving.

Research Scientist, Protopia AI Inc.

2021 – 2022

- Austin, TX, USA
- Built **Stained-Glass**, a privacy-preserving deep-learning framework enabling inference without raw-data exposure.
- Led development and infrastructure integration (Kubernetes + GPU).

- CEO: [Dr. Ebrahimi](#); CTO: [Prof. Esmaeilzadeh](#).
- Resulted in a NeurIPS 2021 Demo publication.

Cloud Architect · [AWS Educate Cloud Ambassador](#)

2020 – 2022

- Seoul, Korea
- Guided 4 startups to cloud-native deployments (Kubernetes, Terraform) and shipped their services.
- Led CI/CD, observability, and cost-optimized autoscaling for social-media back-ends.

Server Engineer, Flysher Inc.

2019

- Seoul, Korea
- Shipped back-end features for 4 social-game titles; one reached global top-10 on Facebook.
- Built an ETL → Redshift analytics pipeline driving data-informed feature rollout.

System Engineer, [AKA Intelligence \(Musio\)](#)

2017 – 2019

- Seoul, Korea
- Designed embedded Linux boards & firmware for the social robot **Musio**.
- Coordinated HW-SW integration and production QA with overseas ODMs.

Publications

Refereed Journal Articles

- 1 M. Ryu, X. Piao, J. Park, **D. Synn**, and J. Kim, “ADaPT: An Automated Dataloader Parameter Tuning Framework using AVL Tree-based Search Algorithms,” *TKIPS*, Jan. 2025.
- 2 **D. Synn**, X. Piao, J. Park, and J. Kim, “Distributed Training of Deep Learning Models Using Micro Batch Streaming,” *KTSDE*, Mar. 2023.
- 3 X. Piao, **D. Synn**, J. Park, and J. Kim, “Enabling large batch size training for dnn models beyond the memory limit while maintaining performance,” *IEEE Access*, 2023.
- 4 J. Han, **D. Synn**, T. Kim, H. Jung, and J. Kim, “Feature Based Sampling: A Fast and Robust Sampling Method for Tasks Using 3D Point Cloud,” *IEEE Access*, Apr. 2022.

Refereed Conference Papers

- 1 **D. Synn**, Z. Guo, S. Ha, and H. Oh, “MotionSmith: A Sketch-Based Design System for Automata Making,” *CHI*, Apr. 2026.
- 2 J. Yu, P. Garg, **D. Synn**, and H. Oh, “Tangible-MakeCode: Bridging Physical Coding Blocks with a Web-Based Programming Interface for Collaborative and Extensible Learning,” *CHI*, Apr. 2025.
- 3 **D. Synn** and J. Kim, “Num Worker Tuner: An Automated Spawn Parameter Tuner for Multi-Processing DataLoaders,” *ACK*, Oct. 2021.
- 4 J. Park, **D. Synn**, and J. Kim, “A Survey on the Advancement of Virtualization Technology,” *KIPS*, May 2021.
- 5 B. Ahn, **D. Synn**, M. Derkani, E. Ebrahimi, and H. Esmaeilzadeh, “Protopia AI: Taking on the Missing Link in AI Privacy and Data Protection,” *NeurIPS*, 2021.
- 6 D. Kim, **D. Synn**, and J. Kim, “SG-Drop: Faster Skip-Gram by Dropping Context Words,” *KIPS*, Nov. 2020.

Preprints

- 1 J. Park, **D. Synn**, X. Piao, and J. Kim, “Dataloader Parameter Tuner: An Automated Dataloader Parameter Tuner for Deep Learning Models,” *arXiv*, 2022.

Honors & Awards

Fellowships

- [Brain Korea 21 \(BK21\)](#) Research Fellowship (2020 - 2022)

Awards

- Dean's List, Spring 2012 & Fall 2020, Electrical Engineering
- Prize Winner, Creative Challenge Program @ [Korea Univ. CTL](#) (2016)
- Prize Winner, Creative Challenge Program @ [Korea Univ. CTL](#) (2015)

Teaching

Head TA, CS 4496/7496 Computer Animation *2024 – Present*

- [Georgia Tech, School of Interactive Computing](#).

Lecturer, Korea University *2021 – 2022*

- Taught Java for 10+ undergraduate students.

Teaching Assistant, Korea University *2021*

- Digital System Design
- Data Structure and Algorithm

Lecturer, KAIST Engineering School *2012 – 2014*

- Created comprehensive coding education programs in collaboration with the **Ministry of Science and ICT** of South Korea.
- Developed 20+ hardware and software development curricula for programming education.
- Emphasized hands-on projects utilizing [Arduino](#) to teach the principles of mobile and ubiquitous computing.
- Guided high-school and college-level students in exploring the third generation of computing through practical projects addressing real-world problems.

Activities & Service

Georgia Tech Korean Student Association *2023 – 2024*

- President of Korean Students in the College of Computing.

Hardware & Software Community, Korea University *2014 – 2019*

- President.
- Grew the engineering community at Korea University from 10 members to over 200 active participants, spanning both hardware and software specialties.

TEDxKoreaUniversity, Korea University *2015 – 2016*

- Founder & Chief Organizer.
- Organized a TEDx event with 200 guests, 7 speakers, 47 team members, and a \$4k budget. Responsibilities included fundraising, sponsorships, editorial decisions, communication planning, and production & media.

References

Professor HyunJoo Oh

Assistant Professor

Georgia Institute of Technology

School of Industrial Design & School of Interactive Computing

Professor Sehoon Ha

Assistant Professor

Georgia Institute of Technology

College of Computing, School of Interactive Computing

Dr. ByungHoon Ahn

Senior Software Engineer, Apple Inc.

bhahn@ucsd.edu

Dr. Eiman Ebrahimi

CEO, Protopia AI Inc.

<http://eimanebrahimi.com>

Professor Hadi Esmailzadeh

CTO, Protopia AI Inc.

Associate Professor, University of California San Diego

<http://cseweb.ucsd.edu/~hadi/>