

# Hyungro Lee

94 Brett Rd  
Piscataway, NJ 08854  
(812) 322 - 6252

## EDUCATION

Indiana University, Bloomington, IN, Ph.D., Computer Science, 2019

Sungkyunkwan University, Seoul, Korea, B.S., Computer Education, 2007

## RESEARCH INTERESTS

My research interests are parallel and distributed systems, HPC for large scale scientific applications

## EMPLOYMENT

**Postdoctoral Research Associate**, Department of Electrical and Computer Engineering, Rutgers University, Piscataway, NJ 2018 - Present

**Teaching Assistant**, Department of Intelligent Systems Engineering, Indiana University 2014-2018

**Research Intern**, Microsoft, Redmond, WA Summer 2013

**Research Assistant**, School of Informatics, Computing, and Engineering, Indiana University, 2009-2013

**Research Intern**, Samsung Electronics, Giheung, Korea Summer 2010

**Software Engineer**, SK Communications, Seoul, Korea 2004-2008

**Software Engineer**, JPD Internet, Seoul, Korea 2002-2004

## PUBLICATIONS

Casalino, L., Dommer, A.C., Gaieb, Z., Barros, E.P., Sztain, T., Ahn, S.H., Trifan, A., Brace, A., Ma, H., **Lee, H.** and Turilli, M., 2020. AI-driven multiscale simulations illuminate mechanisms of SARS-CoV-2 spike dynamics. *BioRxiv*. 2020

**Lee, H.**, Merzky, A., Tan, L., Titov, M., Turilli, M., Alfe, D., Bhati, A., Brace, A., Clyde, A., Coveney, P. and Ma, H., 2020. Scalable HPC and AI Infrastructure for COVID-19 Therapeutics. *arXiv preprint arXiv:2010.10517*.

Eugen Hruska, Vivekanandan Balasubramanian, **Hyungro Lee**, Shantenu Jha, and Cecilia Clementi, "Extensible and Scalable Adaptive Sampling on Supercomputers", *Journal of Chemical Theory and Computation* 2020 16 (12), 7915-7925

Ma, Heng, Debsindhu Bhowmik, **Hyungro Lee**, Matteo Turilli, Michael Young, Shantenu Jha, and Arvind Ramanathan. "Deep generative model driven protein folding simulations." *In Parallel Computing: Technology Trends*, pp. 45-55. IOS Press BV, 2020.

**Hyungro Lee**, Heng Ma, Matteo Turilli, Debsindhu Bhowmik, Shantenu Jha, Arvind Ramanathan, "DeepDriveMD: Deep-Learning Driven Adaptive Molecular Simulations for Protein Folding", *Deep Learning on Supercomputers workshop in cooperation with TCHPC and held in conjunction with SC19*, November 2019

**Hyungro Lee**, Geoffrey Fox, "Big Data Benchmarks of High-Performance Storage Systems on Commercial Bare Metal Clouds", 2019 *IEEE International Conference on Cloud Computing*.

**Hyungro Lee**, Kumar Satyam, Geoffrey Fox, “Evaluation of Production Serverless Computing Environments”, *Proceedings of the 3rd International Workshop on Serverless Computing. ACM, co-located with IEEE Cloud*, July 2018.

**Hyungro Lee**, Geoffrey Fox, “Event-driven Computing on HPC: Experiments with Scientific Applications”, *RIKEN AICS International Symposium* in KOBE, JAPAN, February 2018.

Judy Qiu, Supun Kamburugamuve, **Hyungro Lee**, Jerome Mitchell, Rebecca Caldwell, Gina Bullockz, Linda Hayden, “Teaching, Learning and Collaborating through Cloud Computing Online Classes, *eduHPC workshop at SC17* September 2017.

**Lee, Hyungro**, and Geoffrey C. Fox. “Efficient Software Defined Systems Using Common Core Components.” *Cloud Computing (CLOUD), 10th International Conference on IEEE*, 2017.

**Hyungro Lee**, Geoffrey Fox, “Software Defined Systems with DevOps Tools and Infrastructure Provisioning, *Ph.D. Forum at IPDPS* conference Orlando FL May 30-June 2, 2017.

Badi Abdul-Wahid, **Hyungro Lee**, Gregor von Laszewski, and Geoffrey Fox, “Scripting Deployment of NIST Use Cases” *Technical Report* January 20 2017.

**Lee, H.**, Lee, M., Mohammed Ismail, W., Rho, M., Fox, G. C., Oh, S., & Tang, H. (2016). “MGEScan: a Galaxy-based system for identifying retrotransposons in genomes”. *Bioinformatics*, 32(16), 2502-2504.

Von Laszewski, G., Wang, F., **Lee, H.**, Chen, H., & Fox, G. C. (2014, June). “Accessing multiple clouds with cloudmesh”, In *Proceedings of the 2014 ACM international workshop on Softwaredefined ecosystems* (pp. 21-28). ACM.

**Lee, Hyungro**, et al. “Towards understanding cloud usage through resource allocation analysis on xsede”. *Technical report*, March 25 2014.

**Lee, Hyungro**, “Using Bioinformatics Applications on the Cloud.”, *Technical Report*, 2014.

**Lee, Hyungro**, “Virtualization Basics: Understanding Techniques and Fundamentals.”, *Technical Report*, 2014.

Chae H, Jung I, **Lee H**, Marru S, Lee S, Kim S. “Bio and Health informatics meets Cloud: BioVLab as an example”, *Health Information Science and Systems*, BioMed Central Ltd, 2013, 1, 6.

**Lee H**, Yang Y, Chae H, Nam S, Choi D, Tangchaisin P, Herath C, Marru S, Nephew K, Kim S. “BioVLAB-MMIA: A Cloud Environment for microRNA and mRNA Integrated Analysis (MMIA) on Amazon EC2”, *IEEE Transactions on NanoBioscience*, 09/2012; 11(3):266-72.

von Laszewski, G., **Lee, H.**, Diaz, J., Wang, F., Tanaka, K., Karavinkoppa, S., Fox, G.C. and Furlani, T., 2012, September. “Design of an accounting and metric-based cloud-shifting and cloud-seeding framework for federated clouds and bare-metal environments.” In *Proceedings of the 2012 workshop on Cloud services, federation, and the 8th open cirrus summit* (pp. 25-32). ACM.

**Lee, Hyungro**, et al. “BioVLAB-MMIA: a reconfigurable cloud computing environment for microRNA and mRNA integrated analysis.” *Bioinformatics and Biomedicine (BIBM)*, 2011 IEEE International Conference on. IEEE, 2011.

## TEACHING EXPERIENCE

ENGR-E 222: Intelligent Systems II (Spring 2018)

INFO-I 523: Big Data Applications & Analytics (Fall 2017)

CSCI-B 649: Cloud Computing (Spring 2017)

INFO-I 590: Topics in Informatics	(Spring 2016)
INFO-I 524: Big Data Open Source Software and Projects	(Fall 2015)
BUEX-V 594: Business Global Executive Management	(Spring 2015)
Research Experiences for Undergraduate (REU) in Computing	(Summer 2014)

### ACTIVITIES & TALKS

Presentation at *RIKEN AICS Youth group workshop*, Kobe, Japan 2018.

Participant at *SC 17 Student Volunteer Program*, Denver November 11 - 17 2017.

Participant at *IPDPS 2017 PhD Forum*, Florida, June 2017

Presentation at *ADMI Symposium on Computing at Minority Institutions*, Virginia Beach, FL March 2017.

Undergraduate Mentor *Summer REU Research Program*, June 2014.

Participant at *SciPy Conference*, Austin, TX June 2013.

Presentation at *Targets and Tools for Therapeutic Development*, Cambridge Healthtech Institute, Boston, MA March 2013.

### PROFESSIONAL SERVICE

Reviewer: Briefings in Bioinformatics, Online ISSN 1477-4054, 2018 - 2019

Reviewer: Concurrency and Computation Practice and Experience, Online ISSN 1532-0634, 2015 - 2018

### TECHNICAL SKILLS

<b>Language</b>	C, Python, Bash Shell
<b>Software</b>	Horovod, Keras/PyTorch distributed data parallel, Dask, OpenStack, Ansible, Docker, Cloud REST APIs, HDF5, RabbitMQ, MongoDB, MySQL

### AWARDS & HONORS

ACM Gordon Bell Special Prize for COVID-19 Research: Being part of group work with 27 other researchers, enabling AI workflow for molecular systems on HPC resources, [Press Link](#)

US Department of Energy Secretary's Honor Award: Being part of the National Virtual Biotechnology Laboratory w.r.t. COVID19 therapeutics