

# Minhyuk Park

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## Education

Aug 2021 - May 2026*	University of Illinois Urbana-Champaign PhD in Computer Science (*expected)
Aug 2019 - May 2021	University of Illinois Urbana-Champaign MS in Computer Science
Aug. 2016 - May 2019	University of Illinois Urbana-Champaign BS in Computer Science

## Teaching Experience

TA for FA22, SP23 CS128 at the University of Illinois Urbana Champaign

## Research Interests

Currently working on using ensembles of hidden Markov models to develop multiple sequence alignment methods, devising divide-and-conquer methods in phylogenetics, and detecting substructures in networks using graph clustering. Focusing on bringing scalability and versatility to existing computational biology methods. More broadly interested in databases and computers education.

## Research Experience

Aug. 2020 – Current

**Professor Tandy Warnow**  
Warnow Lab - University of Illinois Urbana-Champaign  
Using ensembles of hidden Markov models to align DNA sequences more accurately.  
Developing new methods for detecting substructures in networks using graph clustering.  
Developing divide-and-conquer pipelines to improve gene tree estimation accuracy.

Aug. 2019 – May 2020

**Professor Kevin Chen-Chuang Chang**  
ForwardData Lab - University of Illinois Urbana-Champaign  
Analyzed database transactions in a human collaborative environment.  
Developed Dataspread-Workbench, a human collaborative database editor, named after Dataspread which integrates a spreadsheet frontend with a SQL backend.

Aug. 2018 - May 2019

**Professor Geoffrey Challen**  
Undergraduate Senior Thesis - University of Illinois Urbana-Champaign  
Looked for various signifiers of high performing students in computer science classrooms and early diagnosis of underperforming students and students who eventually drop the course.

May. 2015 - Jun. 2016

**Student-led Team Project**  
In collaboration with NASA and NanoRacks  
Successfully delivered a student-led project from conception of idea to formulating experiment and sending the payload to space on a SpaceX rocket with the help of NASA.  
Researched the effects of microgravity on plants, compared against phototropism and hydrotropism.  
Created and printed a 3D model of the experiment chamber and parts.  
Calibrated and tested the parts with the whole payload.

May 2015 – Oct. 2015

**Professor Jeong hye Han**  
Cheongju National University of Education  
Assisted research in topics regarding the effects of humanoid type robots in education.  
Successfully submitted the paper to the ACM SIGCHI Conference Proceedings

## Professional Experience

July. 2020 - Aug 2020

**Goldman Sachs**  
Engineering, Controllers Division - Summer Analyst Intern  
Worked with various tools and languages to improve the reporting duties of Goldman Sachs to the Federal Reserve.

May. 2019 - Aug 2019

**Toyota Research Institute**  
Cloud Data, Driving - Software Engineering Intern  
Improved dataset quality for machine learning models by implementing a heuristic-based image linter  
Deployed AWS based pipeline for serverless end-to-end dataset curation  
Developed microservices and APIs for interacting with the datastore

Oct. 2017 - May 2018

**Association of Computing Machinery (ACM)**

**Corporate Lead**

Led a team of nine members as the head of ACM Corporate Committee and assigned proper tasks to each member for effective communication between companies and the school.

Facilitated communication between external corporate companies and the University of Illinois Department of Computer Science and was physically present at tech talks to set up and clean the room on behalf of the Computer Science department and assist in any unexpected situations.

Apr. 2017 – Sept. 2017

**Association of Computing Machinery (ACM)**

**Corporate Committee**

Oversaw all corporate relations and effectively managed communication between corporate entities and ACM, being personally in charge of 40 company contacts on average.

Streamlined the process to recruit more members and created a formal committee and became lead in September.

## Publications

- 1 Tabatabaei, Y., Wedell, E., Park, M. and Warnow, T., 2024. FastEnsemble: A new scalable ensemble clustering method. Accepted. International Conference on Complex Networks and their Applications
- 2 Anne, L., Vu-Le, T.A., Park, M., Warnow, T. and Chacko, G., 2024. Synthetic Networks That Preserve Edge Connectivity. Accepted. International Conference on Complex Networks and their Applications
- 3 Park, M., Feng, D.W., Digra, S., Vu-Le, T.A., Chacko, G. and Warnow, T., 2024. Improved Community Detection using Stochastic Block Models. Accepted. International Conference on Complex Networks and their Applications
- 4 Park, M., Tabatabaei, Y., Liu, B., Pailodi, V.K., Ramavarapu, V., Ramachandran, R., Korobskiy, D., Ayres, F., Chacko, G. and Warnow, T., Well-Connectedness and Community Detection. In Press, PLOS Complex Systems.
- 5 Ramavarapu, V., Ayres, F.J., Park, M., Pailodi, V.K., Lamy, J.A.C., Warnow, T. and Chacko, G., 2024. CM++: A Meta-method for Well-Connected Community Detection. Journal of Open Source Software, 9(93), p.6073.
- 6 Park, M. and Warnow, T., 2023. HMMerge: an ensemble method for multiple sequence alignment. Bioinformatics Advances, 3(1), p.vbad052. Github: <https://github.com/MinhyukPark/HMMerge>
- 7 Park, M., Ivanovic, S., Chu, G., Shen, C. and Warnow, T., 2023. UPP2: fast and accurate alignment of datasets with fragmentary sequences. Bioinformatics, 39(1), p.btad007. Github: <https://github.com/gillichu/sepp>
- 8 Shen, C., Park, M. and Warnow, T., 2022. WITCH: Improved Multiple Sequence Alignment through Weighted Consensus HMM alignment. J. Computational Biology Github: <https://github.com/c5shen/WITCH>
- 9 Wedell, E. and Park, M., 2022. Center-Periphery Structure in Research Communities. Quantitative Science Studies, 3:1: 289-314. Github: [https://github.com/chackoge/ERNIE\\_Plus/tree/master/Illinois/clustering/eleanor/code](https://github.com/chackoge/ERNIE_Plus/tree/master/Illinois/clustering/eleanor/code)
- 10 Park, M., Zaharias, P. and Warnow, T., 2021. Disjoint Tree Mergers for Large-Scale Maximum Likelihood Tree Estimation. Algorithms, 14:5: 148.