

Kyeong Joo, Jung

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EDUCATION

- 2019 – 2026 (Expected) *PhD in Computer Science*, The Ohio State University
 Co-Advisor: Raghu Machiraju (Computer Science & Engineering)
 Dongjun Chung (Biomedical Informatics & Biostatistics)
 Dissertation title: From Cells to Clinical Outcomes: Building a Domain-Specific Foundation Model through AI/ML-Enriched Spatial Proteomics
 Ohio, USA
- 2025 *MS in Computer Science*, The Ohio State University
 Ohio, USA
- 2017 – 2018 *MS in Computer Science*, Stony Brook University-State University of New York (SUNY) Korea
 Advisor: Bong Jun Choi (Distributed Intelligence Lab)
 Republic of Korea
- 2014 - 2015 *Exchange Student in Computer Science (BS)*, Angelo State University
 Texas, USA
- 2011 - 2017 *BS in Computer Engineering*, Yonsei University
 Republic of Korea

RESEARCH INTERESTS

AI/ML for Precision Oncology & Computational Pathology, Foundation Models & Big Data, Spatial Bioinformatics, Privacy-Preserving Healthcare AI

PEER-REVIEWED PUBLICATIONS

* : Equal contribution

Methodology paper

1. **Jung KJ**, Ghose S, Cho S, McDonough E, Chadwick C, West R, Brooks JD, Chung D, Ginty F, Machiraju R, Mallick P (2026). Annotation-Free Prediction of Cancer Cells and Glands and Spatial Analysis of Immune Cells. *PLOS Computational Biology*. (Under Review). [\[bioRxiv\]](https://doi.org/10.1371/journal.pcbi.1010000) [app url: <https://chunglab.bmi.osumc.edu/TOPAZ/>]
2. Xie J*, **Jung KJ***, Allen C*, Chang Y, Paul S, Li Z, Ma Q, Chung D (2024). Analysis of community connectivity in spatial transcriptomics data. *Frontiers in Applied Mathematics and Statistics*, 10, 1378370. doi.org/10.3389/fams.2024.1403901. [\[link\]](https://doi.org/10.3389/fams.2024.1403901)
 [Package Github url: <https://github.com/carter-allen/banyan>]
3. Karageorgos GM, Cho S, McDonough E, Chadwick C, Ghose S, Owens J, **Jung KJ**, Machiraju R, West R, Brooks JD, Mallick P, Ginty F (2024). Deep learning-based automated pipeline for blood vessel detection and distribution analysis in multiplexed prostate cancer images. *Frontiers in Bioinformatics*, 3. doi:10.3389/fbinf.2023.1296667. [\[link\]](https://doi.org/10.3389/fbinf.2023.1296667)
4. Jeon H, Xie J, Jeon Y, **Jung KJ**, Gupta A, Chang W, Chung D (2023). Statistical power analysis for designing bulk, single-cell, and spatial transcriptomics experiments: Review, tutorial, and perspectives. *Biomolecules*, 13(2), 221. doi.org/10.3390/biom13020221. [\[link\]](https://doi.org/10.3390/biom13020221)

In preparation

1. **Jung KJ**, Rout S, Qiu J, Ghose S, Cho S, McDonough E, Chadwick C, Brooks JD, West R, Ginty F, Chung D, Jadhav K, Machiraju R, Mallick P (2026). A Multi-Task Foundation Representation for Immune–Gland Architecture in Prostate Cancer Histology. (In Preparation).
2. **Jung KJ**, Rout S, Jianwei, Ghose S, Cho S, McDonough E, Chadwick C, Brooks JD, West R, Ginty F, Chung D, Jadhav K, Machiraju R, Mallick P (2026). A Multi-Modal, Immune- and Morphology-Aware Prostate Cancer Histology Dataset with Text Captions, Tissue Maps, and Clinical Outcomes. (In Preparation).

Collaboration paper

1. Schafer JM*, Song NJ*, Xiao T, Gauntner TD, **Jung KJ**, Fitts EG, Kumar K, Jeon HS, Elaoud RA, Reynolds K, Caruso VM, Levin TG, McConkey D, Lee CT, Pohar KS, Clinton SK, Carson WE, Chung DJ, Li Z, Sundi D (2025). T cell subsets of urine-derived lymphocytes (UDLs) serve as an indicator of TILs and reflect immunological sex differences in bladder cancer. *Journal for ImmunoTherapy of Cancer*, 13(10), e012050. doi.org/10.1136/jitc-2025-012050. [\[link\]](https://doi.org/10.1136/jitc-2025-012050)

2. Song NJ, Xie J, **Jung KJ**, Wang Y, Pozniak J, Roda N, Marine JC, Riesenberger BP, Jeon H, Ma A, Cox N, Wethington D, Reynolds K, Xiao T, Li A, Kronen P, Denko N, Carbone DP, Ma Q, Carson WE, Mundy-Bosse BL, Burd CE, Das J, Chung D, Li Z (2025). Tumor-Associated NK Cells Regulate Distinct CD8+ T-cell Differentiation Program in Cancer and Contribute to Resistance against Immune Checkpoint Blockers. *Cancer Discovery* 15(9):1835-1857. doi.org/10.1158/2159-8290.CD-24-1232. [\[link\]](#)

3. Schwarz E, Benner B, Wesolowski R, Quiroga D, Good L, Sun SH, Savardekar H, Li J, **Jung KJ**, Duggan MC, Lapurga G, Shaffer J, Scarberry L, Konda B, Verschraegen C, Kendra K, Shah M, Rupert R, Monk P, Shah HA, Noonan AM, Bixel K, Hays J, Wei L, Pan X, Behbehani G, Hu Y, Elemento O, Chung D, Xin G, Blaser BW, Carson WE (2024). Inhibition of Bruton's tyrosine kinase with PD-1 blockade modulates T cell activation in solid tumors. *JCI Insight*, 9(21), e169927. doi.org/10.1172/jci.insight.169927. [\[link\]](#)

4. Deffenbaugh JL, **Jung KJ**, Murphy SP, Liu Y, Rau CN, Petersen-Cherubini CL, Collins PL, Chung D, Lovett-Racke AE (2024). Novel model of multiple sclerosis induced by EBV-like virus generates a unique B cell population. *Journal of Neuroimmunology*, 394, 578408. doi.org/10.1016/j.jneuroim.2024.578408. [\[link\]](#)

5. Wen RM, Qiu Z, Marti GEW, Peterson EE, Garcia Marques FJ, Bermudez A, Wei Y, Nolley R, Lam N, Polasko AL, Chiu CL, Zhang D, Cho S, Karageorgos GM, McDonough E, Chadwick C, Ginty F, **Jung KJ**, Machiraju R, Mallick P, Crowley L, Pollack JR, Zhao H, Pitteri SJ, Brooks JD (2024). AZGP1 deficiency promotes angiogenesis in prostate cancer. *Journal of Translational Medicine*, 22(1), 383. doi.org/10.1186/s12967-024-05183-x. [\[link\]](#)

Security related paper

1. **Jung KJ**, Woo S (2018). SECURITY Comparison on KOREAN Password / Authentication Policy and Other Countries. *International Journal of Protection, Security & Investigation (J-Institute)*, 3(2), 6-13. doi.org/10.22471/protective.2018.3.2.06. [\[link\]](#)

2. **Jung KJ**, Choi SH, Lee BH, Nam Gung Y, Kim JS, Kim HS, Han JS, Kim T, Choi BJ (2018). POSTER: Undetectable Task Bypassing OS Scheduler via Hardware Task Switching. *Proceedings of the 2018 on Asia Conference on Computer and Communications Security (ASIACCS)*, 801–803. doi.org/10.1145/3196494.3201582. [\[link\]](#)

3. **Jung KJ**, Lee BH, Gung YN, Kim JS, Kim HS, Han JS, Choi BJ (2018). Under Cover of Darkness: Hiding Tasks via Hardware. *HITBSecConf (Hack In The Box Security Conference)*, Amsterdam, Netherlands. (Technical Paper) [\[link\]](#)

4. Woo S, **Jung KJ**, Choi BJ (2018). Survey on Current Password Composition Policies. *Journal of the Korea Institute of Information Security & Cryptology*, 28(1), 43-47. [\[link\]](#)

BOOK CHAPTER

1. Gillespie J, Xie J, **Jung KJ**, Hardiman G, Pietrzak M, and Chung D (2025), "A gentle introduction to spatial transcriptomic analysis with 10X Visium data," To appear in *Methods in Molecular Biology*. <https://j-gillespie-dna.github.io/>

OPEN-SOURCE SOFTWARE & LAB INFRASTRUCTURE

Development of Bioinformatics Tools:

R Shiny App development

TOPAZ: Cell / gland type classification using spatial proteomics

URL: <https://chunglab.bmi.osumc.edu/TOPAZ/>

(In preparation)

Multi-Task Foundation Representation tool for immune-tumor gland architecture in prostate cancer histology. (Python/PyTorch)

Lab Infrastructure

Server Administration: Managed research lab server - resource allocation, and environment update/isolation (EPEL, SCL/Compile Tool/renv) to ensure reproducibility of experiments from different machines.

Deployment: Experience in deploying web applications on Linux-based server.

Ex) <https://chunglab.bmi.osumc.edu/VeteranST/>, <https://chunglab.bmi.osumc.edu/spaDesign/>, <https://chunglab.bmi.osumc.edu/SCOPE/>

PRESENTATION

2025 Multi-modal Domain-specific Foundation Model for Prostate Cancer Explanation: Utilizing H&E Image and Spatial Proteomics
SSACB 2025, NIH (Bethesda), Maryland, August 2025 (Talk, and poster)

2025 Multi-modal Domain-specific Foundation Model for Prostate Cancer Explanation: Utilizing H&E Image and Spatial Proteomics
ICIBM 2025, Columbus, Ohio, August 2025 (Talk, and poster)

- 2024 Prostate Cancer Diagnosis and Prognosis Prediction Using Spatial Proteomics
AIMACCS 2024, Columbus, Ohio, May 2025 (Poster)
- 2023 Analysis of Community Connectivity in Spatial Transcriptomics Data,
KSEA UKC, Dallas, Texas, August 2023(Poster)
Best poster award
- 2018 Undetectable Task Bypassing OS Scheduler via Hardware Task Switching
ASIACCS 2018, Songdo, Korea, June
- 2018 Under Cover of Darkness: Hiding Tasks via Hardware,
HITBSecConf, CommSec, Amsterdam, Netherlands, April 2018.

RESEARCH GROUP

- 2021 ~ present Prostate Cancer Spatial Proteomics Research Group
The Ohio State University, Stanford University, GE Healthcare
Grant No.: R01CA249899
Role: Development of methods for computational pathology (classification, dataset, foundation model)
Collaborated with researchers from industry and pathologists
- 2024 ~ present Center for AI & Bioinformatics in Immuno-Oncology (CATION) - <https://u.osu.edu/cation/>
The Ohio State University
Pelotonia Institute for Immuno-Oncology (PIIO)
Role: Bioinformatician –single cell RNA/TCR/FlowCytometry/
Spatial Transcriptomics/Proteomics/CITEseq analysis
Collaborated with Immuno-oncologists
- 2025 ~ present Biomedical Informatics Shared Resources (BISR)
<https://medicine.osu.edu/departments/biomedical-informatics/resources-and-services/bisr>
The Ohio State University Comprehensive Cancer Center (CCC)
Role: Support BISR in AI training - tutorials / implementation support on neural networks
Consisted of Statisticians, Bioinformatician researchers
- 2021 ~ present Chung lab meeting
The Ohio State University
Role: Presentation hosting, scheduling, and presenting
Consisted of Statistics, Computer Science, Bioinformatics graduate researchers

PATENT

- 2018(expired) Software Code Dynamic Distributing Method and Apparatus
Choi DH, Kim JK, Park JH, Lim SM, Choi J, Hwang TW, Han JS, **Jung KJ**
- 2017(expired) Detection method and device of hidden task using hardware task switching
Lee BH, Choi SH, Kim JS, **Jung KJ**, Nam Gung Y, Kim HS, Han JS

AWARDS & HONORS

- 2023 2023 KSEA-KUSCO Graduate Scholarship
KSEA-KUSCO (\$2,000)
- 2015 *Dean's List for Excellent Academic Achieve*
Angelo State University, San Angelo, Texas

TEACHING EXPERIENCE

- Teaching Assistant at The Ohio State University
2021 CSE1223: Java Programming
- 2020 CSE1223: Java Programming
CSE3461: Computer Networking
- 2019 CSE3461: Computer Networking
- Teaching Assistant at Stony Brook University-State University of New York (SUNY) Korea
2018 BUS215: Intro to Business Statistics

2017 CSE101: Introduction to Computational and Algorithmic Thinking
 CSE114: Computer Science I
 CSE220: System Fundamentals I
 MEC101: Freshman Design Innovation

COURSEWORK

Computer Science and Engineering

CSE6431 Advanced Operating Systems
 CSE6331 Algorithms
 CSE5479 Intermediate Studies in Computer Security
 CSE6341 Foundations of Programming Languages
 CSE5523 Machine learning and Statistical Patterns Recognition
 CSE5526 Introduction to Neural Networks
 CSE5524 Computer Vision for Human-Computer Interaction
 CSE5243 Introduction to Data Mining
 CSE6521 Advanced Survey of Artificial Intelligence

Statistics

STAT6301 Probability for Statistical Inference
 STAT6570 Applied Bayesian Analysis
 STAT6450 Applied Regression Analysis
 STAT6530 Introduction to Spatial Statistics
 STAT6410 Design and Analysis of Experiments
 STAT8750.03 Research Group in Statistical Genetics and Bioinformatics

Biomedical Informatics

BMI8310 Analysis and Application of Genome-Scale Data

SKILLS

- Python, R, Java, C, C++
- Deep Learning (Tensorflow, Keras, Pytorch)
- Database (MySQL, JDBC, XAMPP, TOMCAT)

ACADEMIC LEADERSHIP & SERVICE

2022-2024 *President of Korean Graduate Student Association*
 The Ohio State University
 Role: Led a team to organize large-scale academic seminars, recruiting events, and networking events for over 250 graduate students.
 Managed the association's annual budget and secured funding from external sponsors and the university, resulting in a significant financial surplus for the next administration.
 Helped incoming students and their families to adapt to life at OSU.

2021-2022 *President of Korean Engineering Graduate Student Association*
 The Ohio State University
 Role: Facilitated research exchanges and networking among engineering graduate students. Participated in the NET program (Korean Federation of Science and Technology Societies (KOFST)) to support and fund small research groups.

2011 *Representative of freshmen in Computer Engineering department*
 Yonsei University, Republic of Korea

INDUSTRY EXPERIENCE

2018- 2019 *IT employee at Korea International School IT Team*
 Server/Network maintenance, Web page management, development,
 Privacy management, IT asset management
 Republic of Korea

2016 *Internship at The Korean Association for Industrial Technology Security*
 Security Operation Service
 Equipment check-up on small and medium industrial companies
 Republic of Korea

CERTIFICATES

2017 – 2018 Certificate of *Best of the Best member (Digital Forensics Track)*
 Program training the Next Generation of Top Security Leaders
Korea Information Technology Research Institute (KITRI),
 Republic of Korea

2017 Certificate of *Study & Training*
 Crime Scene Investigation & Forensic Science Program
National Forensic Service,
 Republic of Korea