Jenny Ji Hyun Kim

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EDUCATION

Stanford University, MSc in Epidemiology and Clinical Research *2025 - present*
ETH Zürich, MSc in Biomedical Engineering – Biomechanics, GPA: 5.39/6.00 *2020 - 2024*
McGill University, Bachelor of Mechanical Engineering, GPA: 3.55/4.00 *2013 - 2018*
Korea University, Exchange Semester Abroad *2018*

RESEARCH EXPERIENCE

Graduate Student Researcher, ***Snyder Lab*** **|** ***Stanford School of Medicine,*** Palo Alto *Sept 2025 – present*
Life Science Research Professional *Jan 2024 – Sept 2025*
Visiting Student Researcher *July 2023 – Dec 2023*
Advisor: Michael Snyder, PhD

- Design and lead the *Beneficial Exposome* interventional clinical trial (NCT06093464) to investigate how natural compounds influence holistic human health; oversee participant recruitment, enrollment, communications, and high-quality longitudinal data collection
- Developed and secured Institutional Review Board (IRB) approval (200 participants) for human subjects research involving multi-omics, wearables, validated survey measures, and environmental exposure assessments
- Utilized GC-MS for compound identification, authentication, and quality assurance of plant-derived essential oils
- Established high-throughput in vitro assays in primary and cancer cell lines to quantify cytokines, chemokines, and growth factors using multiplex immunoassay panels, characterize downstream signaling pathways, and evaluate dose-response effects of natural plant-derived oils
- Apply statistical and computational methods to integrate multi-omics (lipidome, metabolome, proteome, microbiome), wearable sensors, dietary logs, and survey data to evaluate the impact of environmental factors on individual health outcomes
- Contribute to grant proposals supporting multi-omics and exposomics research initiatives
- Supervise and mentor undergraduate and high school students in wet-lab and dry-lab techniques, experimental design, and data analysis
- Collaborate with postdoctoral researchers on integrative analyses linking omics profiles, dietary behaviors, exposures, health outcomes in Crohn's disease and habitual dietary health

Research Scholar, ***Motion Analysis Lab*** **|** ***Harvard Medical School,*** Boston *Sept 2022 - June 2023*
Advisor: Paolo Bonato, PhD and Ivan Sunghoon Lee, PhD

- Collaborated with clinicians, from concept to study design, to create a LiDAR and video-based (RGBD) motion analysis and assessment tool for stroke telerehabilitation
- Developed IRB protocol
- Employed pose estimation algorithms, data analysis, and ML techniques to derive clinical score estimates (FMA)
- Utilized marker-based (VICON) and wearable sensor-based (Xsens) motion tracking to validate markerless body tracking
- Collected and synchronized multiple video (RGB), audio and wearable sensor data (IMU) for partial and full body tracking to estimate the recovery progress of stroke patients in home-based settings

Research Assistant, ***Microsoft*** **|** ***Computer Vision and Geometry Group ETH Zürich,*** Zürich *May 2022 - Sept 2022*
Advisor: Marc Pollefeys, PhD

- Collected a multi-modal dataset (including ego-centric video; RGBD tracking, audio, and hand tracking) with Microsoft HoloLens 2; aimed at understanding complex human object manipulation to develop interactive AI assistants
- Recruited and collected data on over 30 participants; Post-processed and performed quality checks on the collected data
- This work 'HoloAssist' was presented at ICCV 2023

Biomedical Research Student, ***Center for Project-Based Learning*** **|** ***ETH Zürich,*** Zürich *Oct 2021 - Feb 2022*
Advisor: Michele Magno, PhD and Seonyeong Heo, PhD

- Designed wearable device with novel QVAR (charge-variation) capacitive sensor and inertial measurement unit (IMU) for human activity recognition and human pose estimation (further classified to detect posture within each activity)
- Acquired and annotated dataset to train traditional machine learning and deep learning models (RNN-LSTM, TCN)

Biomedical Research Student, ***Balgrist University Hospital*** **|** ***ETH Zürich,*** Zürich *Apr 2021 - May 2022*
Advisor: Jonas Widmer, PhD

- Designed deep learning pipeline to aid surgeons in pre-operative planning and post-operative analysis of spinal surgeries
- Developed system for spinal parameter calculation and 3D-reconstruction of a patient-specific skeleton model from X-Rays
- Segmented region of interest using deep CNN based U-Net architecture implemented using TensorFlow
- Implemented CycleGAN to perform style transfer from Digitally Reconstructed Radiographs to X-Ray to improve model

EMPLOYMENT

Working Student, *Wingtra AG,* Zürich *Apr 2021 - Apr 2022*
- Performed field tests on VTOL UAV, WingtraOne
- Quality assurance software updates; reported bugs and incidents that occurred in the field to responsible team leads

Teaching Assistant, *ETH Zürich,* Zürich *Aug 2021 - Dec 2021*
- Assisted in curriculum design of the first-time course: Praktikum Medizintechnik, a course by the Department of Health Sciences and Technology (D-HEST)
- Aided 120 students in a practical course through CAD, FEA, and mechanical testing of a bone plate for a broken femur

Mechanical Engineer, *Mosaic Manufacturing,* Toronto *Apr 2019 - Apr 2020*
- Created an automated, high throughput multi-material 3D printing system and industrial-level 3D printer
- Designed assembly in Solidworks, employing design for assembly (DFA) and design for manufacturing (DFM) practices
- Created detailed 2D drawings with comprehensive application of GD&T principles to ensure precise design specifications
- Reduced production costs by 80% by working with a contract manufacturer in China

Supply Chain Management Intern, *Rolls Royce Canada,* Montreal *Sept 2017 - Dec 2017*
- Worked in scheduling to optimize database management of pending, active, and completed jobs in different teams
- Improved efficiency of workflow on the shop floor through tool developed using VBA to increase visibility and communication leading to an increase in reliability of schedule by 60%

Junior Mechanical Developer, *Quanser Consulting Inc.,* Toronto *May 2015 - Sept 2015*
- Designed an add-on to the company's fundamental product, QUBE-Servo, to illustrate gear kinematics to students
- Experimented with Solidworks and 3D printing to produce pre-assembled, planetary gearboxes
- Presented at a conference (National Instruments (NI) Week) in Austin, Texas

PUBLICATIONS

Kim, J. J. H., Yang, T. B., Zhang, X., Lin, X., Salethoor, S. N., Menon, M. M., & Snyder, M. P. (2025). Harnessing Phytochemicals for Engineering Health Solutions. *Human Genomics* (Accepted)

Park, H., Mayer, C., Wu, Y., **Kim, J.**, Ehlert, B., Lu, Y., Perelman, D., Bejikian, C., & Snyder, M. (2025). Linking Habitual Carbohydrate Intake Patterns to Postprandial Glucose Dynamics, Metabolic and Lipidomic Profiles: The Carbotype Concept. *Current Developments in Nutrition*, 9. https://doi.org/10.1016/j.cdnut.2025.107310 (ASN Nutrition)

Lang, S., Jokeit, M., **Kim, J. H.**, Urbanschitz, L., Fisler, L., Torrez, C., Cornaz, F., Snedeker, J. G., Farshad, M., & Widmer, J. (2025). Anatomical landmark detection on bi-planar radiographs for predicting spinopelvic parameters. *Spine deformity*, 13(2), 423–431. https://doi.org/10.1007/s43390-024-00990-0

Lang, S., **Kim, J. H.,** Jokeit, M., Urbanschitz, L., … Widmer, J. (2024). Automatic Prediction of Spinopelvic Parameters from Bi-Planar Radiographs. *International Meeting on Advanced Spine Techniques* (SRS IMAST).

Berends, W., **Kim, J.,** Wunderlich, B. (2016, Oct 3). Contact Resistance versus Pressure of Electrical Connections Used in Aluminium Smelter Potlines. *International Committee for Study of Bauxite, Alumina & Aluminum* (ICSOBA).

Manuscripts in Preparation

Lan, L.*, Jiang, L.*, Wong, F.*, **Kim, J.*,** Jian, R, Chou, T., Bejikian, C., & Snyder, M. Stability Assessment of Metabolites, Lipids, and Proteins in Tasso-M20 Microsamples. Target: *Nature Methods*, Anticipated submission: Q1 2026

Lan, L., Armstrong, C., Seltzer, J., Wu, Y., **Kim, J.,** Kellogg, R., Chou, T., Shome, M., Jiang, L., Li, J., Liu, L., Tang, O. Z., & Snyder, M. Longitudinal Analyses of Long COVID, ME/CFS and PTLDS Using Wearable Devices and Microsampling. Target: *Nature Medicine*, Anticipated submission: Q2 2026

Park, H., Mayer, C., Wu, Y., **Kim, J.**, Ehlert, B., Lu, Y., Perelman, D., Bejikian, C., & Snyder, M. Linking Habitual Carbohydrate Intake Patterns to Postprandial Glucose Dynamics, Metabolic and Lipidomic Profiles: The Carbotype Concept. Target: *Nature Food*, Anticipated submission: Q2 2026

Zhang, X.*, Lin, X.*, Tiersma, M.*, **Kim, J.***, Wu, J., & Snyder, M. Multi-omics Approaches to Unravel Gene-Environmental Interactions in Noncommunicable Diseases. Target: *Human Genomics*, Anticipated submission: Q2 2026

Shih, J.H.*, Mayer, C.*, Schussler-Fiorenza Rose, S.M., Kamtam, D.N., Zhang, X., Chou, T., Tiersam, M.B. Tiersma, M., **Kim, J.** , Li, J.W., Celli, A., Jiang, L., Lautman, Z.D., Ikeda, C.J., McGuire, L., Rangan, E.S., Chang, E., Vilches-Moure, J., Attardi, L., Lui, N., Winslow, M., Shrager, J., Villalba Oliva, M.Á., & Snyder, M. Development of a Prediction Model for Cancer Progression Using Longitudinal Wearable Monitoring. Target: *Nature Medicine*, Anticipated submission: Q3 2026

Zhang, X.*, Lin, X.*, Ge, Y., Tiersma, M., **Kim, J.,** Li, J., Alavi, A., Bahmani, A., Cha, K., McGuire, L., Park, H., Shen, X., Wu, J., & Snyder, M. Longitudinal Monitoring of the Human Exposome in Crohn's Disease. Target: *Nature*, Anticipated Submission: Q4 2026

Zhang, X.*, Lin, X.*, Yeager, R.*, Tiersma, M.*, **Kim, J.***, Wu, J., Keith, R., Sears, C., Bhatnagar, A., & Snyder, M. Associations Between the Exposome, Greenness, and Blood Pressure. Target: *Circulation Research*, Anticipated Submission: Q4 2026

PRESENTATIONS & ABSTRACTS

Kim, J.J.H., Zhang, X., Lin, X., Chadha, N., Yang, T., & Snyder, M. (2024). Beneficial Exposome: Understanding Nature's Impact on Holistic Human Health. *Stanford Genetics Retreat*

Kim, J. H., Corniani, G., & Bonato, P. (2023, Oct 9). Recover-on-Track: A LiDAR and Video-based Tool for Stroke Telerehabilitation. *Body Sensor Networks - Sensors and Systems for Digital Health* (IEEE BSN).

Jokeit, M., **Kim, J. H.**, Snedeker, J. G., Farshad, M., & Widmer, J. (2022, April 22). Mesh-based 3D Reconstruction from Bi-planar Radiographs. *Medical Imaging with Deep Learning* (MIDL).

AWARDS

Best Poster Award, First Place: IEEE Body Sensor Networks - Sensors and Systems for Digital Health *2023*
Best Pitch Award: ETH Sustainable Development Goal Pitch Event *2021*
Best Pitch Award: AI + X Summit *2021*

OTHER EXPERIENCE

InCube Challenge Participant, *ETH Entrepreneur Club | Microsoft,* Zürich & Lugano *Oct 2021*
- Participated in an entrepreneurial challenge to solve a challenge presented by Microsoft: 'How can we leverage space technology to improve local quality of life?'
- Developed 'KALDI', a risk management tool utilizing satellite data and AI, designed to help coffee roasters minimize the impact of climate change on the coffee supply chain – received best pitch award

Technical Director/Mechanical Designer, *McGill Baja Racing Team* *Sept 2015 - Feb 2018*
- Optimized the suspension of the 2017 and 2018 Baja with focus on validation and design cycle completion (Designed geometry using Optimum Kinematics; Built CAD assembly and performed FEA using NX); reduced turning radius by 20%
- Operated CNC machines, executed carbon fiber layups and conducted simple machining processes
- Managed the team's engineering drawings to be sent to manufacturing sponsors and raw material suppliers
- Offered technical support to team members and overviewed system integration
- Drove vehicle, placed: 3rd in Hill Climb, 6th in Acceleration, 3rd Dynamics, 12th Overall out of 108 teams

SKILLS & INTERESTS

Software: SAS, R, Python, MATLAB, Solidworks, Siemens NX, Fusion 360, Optimum Kinematics, OpenSim, Unity, Blender

Interests: Painting, Yoga (Yoga Alliance RYT 500 Certified), Rock Climbing (Korea University Alpine Club, Akademischer Alpenclub Zürich, Harvard Mountaineering Club)