

Ji Woong (Brian) Kim

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Stanford, CA - 94305, USA

EDUCATION

- **Johns Hopkins University** Sept 2018 - Nov 2023
Ph.D in Mechanical Engineering, Robotics Concentration Baltimore, USA
 - Advisor: Marin Kobilarov
- **Johns Hopkins University** Sept 2013 - May 2018
B.S. in Mechanical Engineering Baltimore, USA

WORK EXPERIENCE

- **Stanford University** Jan 2025 - Current
Postdoctoral Researcher, Advised by Chelsea Finn Stanford, USA
 - Building foundation models for generalist robots
- **Johns Hopkins University** Nov 2023 - Dec 2024
Postdoctoral Researcher, Advised by Axel Krieger Baltimore, USA
 - Building dexterous and long-horizon policies for surgical robots
- **Zoxx Inc.** May 2022 – Sep 2022
Motion Planning and Controls Intern Foster City, USA
 - Developed planner-centric metrics for optimal planner model selection
- **Johns Hopkins University** August 2015 – May 2017
Research intern Baltimore, USA
 - Studied how mechanical forces impact cellular behavior
- **Automated Processes Incorporated (API)** May 2014 – August 2014
Intern Jessup, USA
 - Assembled various sound mixing boards used in music studios

JOURNAL PAPERS

- [J.12] Open-H Embodiment Consortium. **Open-H-Embodiment: A Large-Scale Dataset for Enabling Foundation Models in Medical Robotics.** *Under Review.*
- [J.11] L. Zbinden, N. Nelson, J. T. Chen, X. Chen, **J. W. Kim**, M. Azizian, A. Krieger, S. Huver. **Cosmos-Surg-dVRK: World Foundation Model-based Automated Online Evaluation of Surgical Robot Policy Learning.** in *IEEE Robotics and Automation Letters (RA-L)* (2026).
- [J.10] P. Hansen, **J. W. Kim**, A. Goldenberg, J.T. Chen, A. Li, A. Deguet, B. White, D. Tsai, R. Cha, J. Jopling, P. Scheikl, A. Krieger **ImitateCholec: A Multimodal Dataset for Long-Horizon Imitation Learning in Robotic Cholecystectomy.** *Nature Scientific Data* (2026).
- [J.9] **J. W. Kim**, J. T. Chen, P. Hansen, L. X. Shi, A. Goldenberg, S. Schmidgall, et al. **SRT-H: A hierarchical framework for autonomous surgery via language-conditioned imitation learning.** *Science Robotics* (2025), 10(104).
Cover of July edition & 2nd highest Altmetric score among all Science Robotics papers
- [J.8] S. Schmidgall, J. D. Opfermann, **J. W. Kim**, A. Krieger. **Will your next surgeon be a robot? Autonomy and AI in robotic surgery.** *Science Robotics* (2025), 10(104).
- [J.7] M. Esfandiari, **J. W. Kim**, P. Zhang, J. S. Heng, P. Gehlbach, R. H. Taylor, I. Iordachita. **Bimanual Robotic Eye Manipulation Using Adaptive Sclera Force Control: Towards Safe Retinal Vein Cannulation.** *IEEE Transactions on Medical Robotics and Bionics* (2025).

- [J.6] S. Schmidgall, J. W. Kim, A. Kuntz, A. E. Ghazi, A. Krieger. **General-purpose foundation models for increased autonomy in robot-assisted surgery.** *Nature Machine Intelligence* (2024), 6, 1275–1283.
- [J.5] S. Schmidgall, C. Harris, I. Essien, ... J. W. Kim, et al. **Evaluation and mitigation of cognitive biases in medical language models.** *npj Digital Medicine* (2024), 7(1), 295.
- [J.4] S. Schmidgall, J. W. Kim, A. Krieger. **Robots learning to imitate surgeons—challenges and possibilities.** *Nature Reviews Urology* (2024), 21(8).
- [J.3] P. Zhang, J. W. Kim, P. Gehlbach, I. Iordachita, M. Kobilarov. **Autonomous needle navigation in subretinal injections via iOCT.** *IEEE Robotics and Automation Letters (RA-L)* (2024), 9(5).
- [J.2] J. W. Kim, S. Wei, P. Zhang, P. Gehlbach, J. U. Kang, I. Iordachita, M. Kobilarov. **Towards autonomous retinal microsurgery using RGB-D Images.** *IEEE Robotics and Automation Letters (RA-L)* (2024), 9(4).
Best poster award at IROS 2023 (Data vs Model in Medical Robotics workshop)
- [J.1] M. G. Urias, N. Patel, C. He, A. Ebrahimi, J. W. Kim, I. Iordachita, P. L. Gehlbach. **Artificial intelligence, robotics and eye surgery: are we overfitted?.** *International Journal of Retina and Vitreous* (2019), 5(1).

CONFERENCE PAPERS

- [C.12] J. W. Kim, K. Wang, S. Liu, Z. Fu, C. Gao, J. Lai, C. Finn. **Ego-Pi: VLA Fine-Tuning for Ego-Centric Human and Robot Data.** In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Findings*, 2026.
- [C.11] N. Barnes, J. W. Kim, L. Di, H. Qu, A. Bhattacharjee, et al. **Autonomous Soft Robotic Guidewire Navigation via Imitation Learning.** *Under review* (2025).
- [C.10] J. Haworth, J. T. Chen, N. Nelson, J. W. Kim, M. Moghani, C. Finn, A. Krieger. **SutureBot: A Precision Framework & Benchmark For Autonomous End-to-End Suturing.** *NeurIPS* (2025).
- [C.9] J. T. Chen, X. Chen, J. W. Kim, P. M. Scheikl, R. J. Cha, A. Krieger. **SurgiPose: Estimating Surgical Tool Kinematics from Monocular Video for Surgical Robot Learning.** *IROS* (2025).
- [C.8] J. W. Kim, T. Z. Zhao, S. Schmidgall, A. Deguet, M. Kobilarov, C. Finn, A. Krieger. **Surgical Robot Transformer (SRT): Imitation Learning for Surgical Tasks.** *Conference on Robot Learning (CoRL)* (2024).
Oral presentation (4.5%)
- [C.7] M. Esfandiari, J. W. Kim, B. Zhao, G. Amirkhani, M. Hadi, P. Gehlbach, I. Iordachita. **Cooperative vs. teleoperation control of the steady hand eye robot with adaptive sclera force control: A comparative study.** *IEEE International Conference on Robotics and Automation (ICRA)* (2024).
- [C.6] P. Zhang, J. W. Kim, P. Gehlbach, I. Iordachita, M. Kobilarov. **Autonomous needle navigation in retinal microsurgery: Evaluation in ex vivo porcine eyes.** *IEEE International Conference on Robotics and Automation (ICRA)* (2023).
- [C.5] K. Mach, S. Wei, J. W. Kim, A. Martin-Gomez, P. Zhang, J. U. Kang, et al. **OCT-guided robotic subretinal needle injections: A deep learning-based registration approach.** *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)* (2022).
- [C.4] S. Wei, J. W. Kim, A. Martin-Gomez, P. Zhang, I. Iordachita, J. U. Kang. **Region targeted robotic needle guidance using a camera-integrated optical coherence tomography.** *Optical Coherence Tomography* (2022).
- [C.3] P. Zhang, J. W. Kim, M. Kobilarov. **Towards safer retinal surgery through chance constraint optimization and real-time geometry estimation.** *IEEE Conference on Decision and Control (CDC)* (2021).
- [C.2] J. W. Kim, P. Zhang, P. Gehlbach, I. Iordachita, M. Kobilarov. **Towards autonomous eye surgery by combining deep imitation learning with optimal control.** *Conference on Robot Learning (CoRL)* (2021).

- [C.1] J. W. Kim, C. He, M. Urias, P. Gehlbach, G. D. Hager, I. Iordachita, M. Kobilarov. **Autonomously navigating a surgical tool inside the eye by learning from demonstration.** *IEEE International Conference on Robotics and Automation (ICRA)* (2020).

TECHNICAL REPORTS

- [T.3] S. Schmidgall, J. W. Kim, J. Jopling, A. Krieger. (2024). **General surgery vision transformer: A video pre-trained foundation model for general surgery.** *arXiv preprint arXiv:2403.05949*.
- [T.2] H. Ding, Y. Zhang, H. Shu, X. Lian, J. W. Kim, A. Krieger, M. Unberath. (2024). **Towards robust algorithms for surgical phase recognition via digital twin-based scene representation.** *arXiv preprint arXiv:2410.20026*.
- [T.1] J. W. Kim, P. Zhang, P. Gehlbach, I. Iordachita, M. Kobilarov. **Micromanipulation in Surgery: Autonomous Needle Insertion Inside the Eye for Targeted Drug Delivery.** *Robotics: Science and Systems (RSS) Workshop* (2023).

INVITED TALKS

Upcoming invited talks

- Georgia Chapter of the American College of Cardiology, *Invited talk* November 2026
- ASU Medical Robotics Course, *Invited talk* October 2026
- 74th Brazilian Colorectal Congress, *Invited talk* September 2026
- IROS Workshop on Surgical Autonomy, *Panelist* September 2026

Building Generalist Robots for Healthcare: From Surgical Robots to Humanoids

- Yale AI in Surgical Care Symposium, *Invited talk* June 2026
- Samsung Medical Center, *Invited talk* June 2026
- Johns Hopkins University, *guest lecture in robot learning course* April 2026
- GRASP seminar at UPenn, *Invited talk* April 2026
- Korean Society of Artificial Intelligence in Medicine, *Invited talk* March 2026
- Samsung Medical Center, *Invited talk* Jan 2026
- Seoul National University, *Invited talk at AI Computing School* Dec 2025

Building Robot Models That Can Perform Any Surgeries

- Neural Information Processing Systems (NeurIPS), *Invited talk at GenAI4Health workshop* Dec 2025
- CRSA 16th Worldwide Congress, *Invited talk* Nov 2025
- Conference on Robot Learning (CoRL), *Invited talk at Automating Robotic Surgery workshop* Sept 2025
- China GI Surgical Forum, *Invited talk* Sept 2025
- Korean Society of Endo-Laparoscopic & Robotic Surgery (KSERS), *Invited talk* April 2025

SRT-H: A Hierarchical Framework for Autonomous Surgery via Language-Conditioned Imitation Learning

- Livsmed, *Invited talk* Sept 2025

Surgical Robot Transformer (SRT): Imitation Learning for Surgical Tasks

- Johns Hopkins University, *Invited talk at Malone Center* April 2024

Towards Autonomous Retinal Microsurgery Using RGB-D Images

- Johns Hopkins University, *Invited talk in Iulian Iordachita's lab* April 2021

Autonomous Needle Insertion in Microsurgery: a First Demonstration on ex-vivo Pig Retinal Veins

- Johns Hopkins University, *Invited talk at graduate seminar* April 2022

Towards Autonomous Eye Surgery by Combining Deep Imitation Learning and Optimal Control

• Johns Hopkins University, *Invited talk at graduate seminar*

April 2021

HONORS AND AWARDS

- | | |
|---|------|
| • Malone Center Best Presentation Award | 2024 |
| • Best poster award at IROS (Data vs Model in Medical Robotics workshop) | 2023 |
| • Provost's Undergraduate Research Award | 2016 |

TEACHING

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|--|-------------|
| • Teaching Assistant, Johns Hopkins University
Applied Optimal Control (Marin Kobilarov) | Fall 2022 |
| • Teaching Assistant, Johns Hopkins University
Nonlinear Control and Planning in Robotics (Marin Kobilarov) | Spring 2022 |

STUDENT MENTORING

Ph.D. Students

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|-------------------------------------|--|
| • Juo-Tung Chen (JHU → Ph.D at JHU) | Science Robotics & NeurIPS 2025, in-progress |
| • Noah Barnes (JHU) | in-progress |
| • Xinhao Chen(JHU) | in-progress |
| • Sam Schmidgall (JHU → Google) | CoRL & Nature Machine Intelligence 2024 |
| • Jesse Haworth (JHU) | NeurIPS 2025 |
| • Mojtaba Esfandiari (JHU) | ICRA 2024 |

Master's Students

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| • Ke Wang (Stanford) | in-progress |
| • Pascal Hansen (JHU) | Science Robotics 2025 |
| • Kristina Mach (JHU) | BIBM 2022 |
| • Peiyao Zhang (JHU → Ph.D at JHU) | CoRL 2020 |

Undergraduate Students

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| • Javier Nieto (Stanford) | in-progress |
| • Antony Goldenberg (JHU) | Science Robotics 2025 |

SERVICES

Peer Review

- CoRL, RSS, RA-L, T-RO, TBME, ICRA, IROS, MICCAI, IPCAI

SELECTED PRESS COVERAGE

- [P43] Robots learn surgical tasks by watching videos, *The Washington Post*, Dec 22, 2024.
- [P42] Robot surgery on humans could be trialled within decade after success on pig organs, *The Guardian*, July 9, 2025.
- [P41] Experimental surgical robot performs gallbladder procedure autonomously, *Reuters*, July 2025.
- [P40] Surgical robots take step towards fully autonomous operations, *New Scientist*, July 2025.
- [P39] Robot listens to spoken instructions and performs surgery just like a human, *The Independent*, July 2025.
- [P38] A robot shows that machines may one day replace human surgeons, *El Pais*, July 9, 2025.
- [P37] Robot performs realistic gallbladder surgery with 100% accuracy, *Sky News*, July 2025.

- [P.36] Robot Gallbladder Surgery, *Science Friday*, July 2025.
- [P.35] Autonomous robot performs first realistic surgery without human help, *CTV News*, July 9, 2025.
- [P.34] AI-trained robots surgery success on PIGS, *Daily Mail*, July 2025.
- [P.33] AI-trained robot completes groundbreaking gall bladder operation with 100% success, *NY Post*, July 12, 2025.
- [P.32] Robot performs surgery for first time, *The Mirror (UK)*, July 2025.
- [P.31] Robotic surgery: Autonomous gallbladder removal, *UPI*, July 9, 2025.
- [P.30] AI-guided robot performs complex gallbladder surgery autonomously, *South China Morning Post*, July 2025.
- [P.29] In a first, a robot listened to spoken instructions and performed surgery, *IFL Science*, July 2025.
- [P.28] AI-Controlled Robot Gallbladder Removal 100 Percent Accuracy, *Futurism*, July 2025.
- [P.27] Worlds first robot surgery, *New Atlas*, July 2025.
- [P.26] An autonomous gallbladder robot: realistic surgery, *Tech Xplore*, July 2025.
- [P.25] Robot successfully removes gallbladder with 100% accuracy, *Cybernews*, July 2025.
- [P.24] Johns Hopkins teaches robot to perform a gallbladder removal on a realistic patient, *The Robot Report*, July 2025.
- [P.23] AI surgical robot removes gallbladder, *Interesting Engineering*, July 2025.
- [P.22] Robot at Johns Hopkins performs first autonomous surgery, *Courthouse News*, July 2025.
- [P.21] From Imitation to Action: Johns Hopkins Robot Autonomously Performs Key Step, *MedTech Insight*, July 2025.
- [P.20] Johns Hopkins AI-powered, voice-controlled robot performs autonomous surgery, *Fierce Biotech*, July 2025.
- [P.19] Robot performs surgery without a human controlling its hands for the first time ever, *Earth.com*, July 2025.
- [P.18] Robot surgeon flawlessly perform surgery, *Study Finds*, July 2025.
- [P.17] Da Vinci Code: First Autonomous Robot Surgery Achieved in Pig Cadavers, *Inside Precision Medicine*, July 2025.
- [P.16] Robot performs surgery with '100% accuracy', *Fox News*, July 2025.
- [P.15] Robotic surgery hits 'milestone' with autonomous gallbladder removal, *Miami Herald*, July 10, 2025.
- [P.14] Robot surgeon executes key phase of surgery without human assistance, *HPCwire*, July 9, 2025.
- [P.13] Doctors at Stanford and Johns Hopkins operate on animal organs without human intervention, *DeepLearning.AI*, July 2025.
- [P.12] Robot performs realistic surgery 'with 100% accuracy', *The National*, July 9, 2025.
- [P.11] Robot performs surgery with 100% accuracy on its own, *The Herald (Scotland)*, July 9, 2025.
- [P.10] 100% Success Rate: AI Surgeon Does What Humans Can't Guarantee, *Sify*, July 25, 2025.
- [P.9] Robot performs realistic surgery 'with 100% accuracy', *Border Telegraph*, July 9, 2025.
- [P.8] AI-guided robot performs surgery alone and shocks doctors, *Click News*, July 12, 2025.
- [P.7] AI-Powered Robot Performs First Autonomous Surgery on Patient Model, *OECD.AI*, July 9, 2025.
- [P.6] AI surgical robot performs gallbladder op autonomously, *MedicalBrief*, July 16, 2025.
- [P.5] Robot Performs Realistic Surgery Without Human Help, *OR Today*, September 1, 2025.
- [P.4] Robotic surgery hits 'milestone' with autonomous gallbladder removal, *UCL News*, July 10, 2025.

- [P.3] Automation in Construction: AI-powered surgical robot SRT-H, *Automation in Construction*, August 2, 2025.
- [P.2] Robot performs first realistic surgery without human help, *The Hub (JHU)*, July 9, 2025.
- [P.1] Robot injects drugs into back of eyeball more accurately than surgeons, *New Scientist*, 2023.