



Laboratory for Computational Sensing & Robotics

JHU ROBOTICS: INDUSTRY DAY 2022

Monday 3/21 Zoom: <https://wse.zoom.us/j/92114689147>

1:00 pm	Welcome WSE: Larry Nagahara, Associate Dean for Research
1:05 pm	Introduction to LCSR: Russell H. Taylor, Director
1:25 pm	LCSR Education: Louis Whitcomb, Deputy Director
1:40 pm	Student Research Talk – Max Li
1:50 pm	Student Research Talk – Will Pryor
2:00 pm	Student Research Talk – Neha Thomas
2:10 pm	Student Research Talk – Filip Aronshtein and Peter Weiss
2:20 pm	Break
2:30 pm	JHTV – Seth Zonies
2:45 pm	Industry Talk – Gouthami Chintalapani, Siemens
3:05 pm	Industry Talk – Vinutha Kallem, Waymo
3:25 pm	Break
3:35 pm	New Faculty Talk – Axel Krieger
3:55 pm	New Faculty Talk – Mathias Unberath
4:15 pm	Closing: Russell H. Taylor, Director

Tuesday 3/22 Gather Town: <https://gather.town/app/dywY5RsjyGouWiCL/gather-for-lcsr>

1:00-3:00pm	Virtual Poster and Demo Sessions (see chart below)
3:00-4:00pm	Resume Review – if you are participating, please see specific email
4:00-5:00pm	Networking Reception (see chart below)

Student Presenters:

Max Li “Towards Vision-guided Skull-base Surgery”

Max (Zhaoshuo) Li is a computer science PhD student working with Prof. Mathias Unberath and Prof. Russell H. Taylor. He is a member of ARCADE (<https://arcade.cs.jhu.edu/>) and CIIS (<https://ciis.lcsr.jhu.edu/>) research groups in LCSR. His research interests include vision navigation, 3D reconstruction and robotics. He has published in conferences including ICCV, MICCAI, IROS, ICRA and IPCAI. He previously interned at Intuitive Surgical and Meta Reality Labs. He received his bachelor degree from University of British Columbia supervised by Prof. Septimiu E. Salcudean. More about his work can be found at: <https://github.com/mli0603>.

Will Pryor

Will Pryor is a fourth year Computer Science PhD student in Dr. Peter Kazanzides' lab working on teleoperation interfaces for remotely controlling satellite servicing robots from Earth. He also works with Dr. Axel Krieger on visual perception for the MagnetoSuture system for magnetically actuated surgical tools.

Neha Thomas “Neurophysiological evaluation of haptic feedback for myoelectric prostheses”

Neha Thomas is a biomedical engineering PhD student working with Prof. Jeremy Brown on haptic feedback for upper-limb prostheses. She received a Bachelor's and Master's degree in biomedical engineering from Drexel University. She is also a recipient of the NSF Graduate Research Fellowship and was a Fulbright Scholar to Germany.

Filip Aronshtein and Peter Weiss “Quantum Computing for Robotics”

Dirac is an early-stage quantum computing software company developing algorithms and applications for robotics problems. At Dirac, we're making quantum advantage accessible to roboticists. By connecting the mathematics of robotics to that of quantum information science, we're developing quantum-based robotics solutions that reduce the computation cost, runtime, and algorithmic complexity of current methods. Leveraging this theory, we're building easy-to-use integrations that enable robotics companies to upgrade their current systems and tackle problems that they never before thought were possible.

The founders of Dirac, Filip Aronshtein (CEO) and Peter Weiss (CTO), are graduate students in the JHU LCSR in their last semester of the Robotics MSE program. They both completed their Bachelor's in Electrical Engineering at JHU.

Industry Presenters:

Seth Zonies “Why now is a great time to invest in a partnership with the LCSR”

Seth Zonies is the Director of Business Development for the Whiting School of Engineering (WSE) within the Johns Hopkins Tech Ventures office. Seth has expertise in sourcing, shaping, and executing University Industry partnerships in technical disciplines ranging from computational biology to AI and from therapeutics to material science. Seth received his PhD from Johns Hopkins University in 2011 studying developmental genetics. He joined the Tech Ventures office after completing his dissertation and has held several positions in the organization including as an analyst, Commercialization Academy head, and Sr. Licensing Associate.

Gouthami Chintalapani “Imaging for Interventions”

Gouthami Chintalapani is a Senior Staff Scientist at Siemens Medical Solutions USA Inc., with expertise in interventional imaging and precision therapy. She received her PhD from Johns Hopkins University in 2010 working on statistical atlases of bony anatomy with application towards hip dysplasia. She then joined Siemens as a Staff Scientist/research collaborations manager and focused on advanced CBCT algorithms, image guidance and navigation applications in neuro- and oncological interventional procedures at luminary hospitals at the Texas Medical Center, Houston, TX. She continued to advance her career in image guided interventions and is currently exploring the utility of combined angiography and CT units for precision therapy in interventional oncology at MD Anderson Cancer Center. Most recently, she was recognized by Siemens Healthineers as a Senior Key Expert in multimodality integration.

Vinutha Kallem

Vinutha Kallem is a Product lead for Behavior Prediction for autonomous vehicles at Waymo. She has expertise in robotics and autonomy ranging from legged robots, medical robots, drones to most recently self-driving cars. With stints across research, engineering, and product, Vinutha is passionate about using autonomy to improve quality of life.

Vinutha holds a PhD in robotics from Johns Hopkins, MS from Stanford and bachelor’s degree from IIT Madras. She previously was an adjunct faculty at UPenn.

Faculty Presenters:

Axel Krieger “Advancing autonomy for robotic surgery and interventions”

Bio: Axel Krieger, PhD, joined the Johns Hopkins University as an Assistant Professor in the Department of Mechanical Engineering in July 2020. He is leading a team of students, scientists, and engineers at the IMERSE lab in the research and development of robotic tools and laparoscopic devices. Projects include the development of a surgical robot called smart tissue autonomous robot (STAR) and the use of 3D printing for surgical planning and patient specific implants. Professor Krieger is an inventor of over twenty patents and patent applications. Licensees of his patents include medical device start-ups Activ Surgical and PeriCor as well as industry leaders such as Siemens, Philips, and Intuitive Surgical. Before joining the Johns Hopkins University, Professor Axel Krieger was Assistant Professor in Mechanical Engineering at the University of Maryland and Assistant Research Professor and Program Lead for Smart Tools at the Sheikh Zayed Institute for Pediatric Surgical Innovation at Children’s National. He has several years of experience in private industry at Sentinelle Medical Inc and Hologic Inc. His role within these organizations was Product Leader developing devices and software systems from concept to FDA approval and market introduction. Dr. Krieger completed his undergraduate and master’s degrees at the University of Karlsruhe in Germany and his doctorate at Johns Hopkins, where he pioneered an MRI guided prostate biopsy robot used in over 50 patient procedures at three hospitals.

Mathias Unberath “Catalyzing the exploratory design of intelligent surgical systems through in silico experiments”

Dr. Mathias Unberath is an Assistant Professor in the Department of Computer Science at Johns Hopkins University, core faculty in the Laboratory for Computational Sensing and Robotics and fellow of the Malone Center for Engineering in Healthcare. Dr. Unberath is leading the ARCADE research group on Advanced Robotics and Computationally Augmented Environments. The lab develops collaborative intelligent systems that support clinical workflows to increase the access to – and expand the possibilities of highest-quality healthcare. Through synergistic advancement of imaging, computer vision, machine learning, and interaction design, the ARCADE lab pioneers human-centered solutions that are embodied in emerging technology such as mixed reality and robotics.

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Virtual Poster/Demo Session

Poster	Presenter	Email	Topic
1	Max Li	zli122@jhu.edu	Towards Vision-guided Skull-base Surgery
2	Adnan Munawar	amunawa2@jh.edu	Drilling Simulator for Skull Base Surgery
3	Anna Goodridge	anna.goodridge@jhu.edu	Hand-over-hand Robot Assisted Skull Base Surgery
4	Miles Liu	mliu59@jhu.edu	Automated Mosquito Salivary Gland Extraction Robot
5	Yuxiang Gao	yuxiang.gao@jhu.edu	Automating the Sterile Processing Process
6	Alireza Alamdar	aalamda3@jhu.edu	Toward an accurate and compact robot for retinal surgery.
7	Yanzhou Wang	ywang521@jhu.edu	Design and Evaluation of an MR-Conditional Needle Driving Device Towards Regulatory Approval and Clinical Use
8	Justin Opfermann	jopferm1@jhu.edu	Autonomous Robotic Soft Tissue Surgery
9	Lidia Al-Zogbi	lalzogb1@jhu.edu	Ultrasound Guided Robotic Catherization
10	Onder Erin	oerin@jhu.edu	Magnetic Miniature Tools for Ultra Minimally Invasive Surgeries
11	Xiaolong Liu	xiaolong@jhu.edu	Cardiac Planning and Patient Specific Implant Design
12	Hyunwoo Song	hsong37@jhu.edu	Real-time intraoperative surgical guidance system in the da Vinci surgical robot
13	Keshuai Xu	keshuai@jhu.edu	AutoInFocus, a new paradigm for ultrasound-guided spine intervention: a multi-platform validation study
14	Baichuan Jiang	baichuan@jhu.edu	Automatic photoacoustic detection of hypoxic-ischemic encephalopathy with deep learning
15	Qiyuan Fu	fqiuyan1@jhu.edu	Terradynamics Lab
16	Neha Thomas	neha.thomas@jhmi.edu	Haptics and Medical Robotics Laboratory
17	Mohit Singhala	mohit@jhu.edu	A novel testbed for investigating the impact of teleoperator dynamics on perceived environment dynamics
18	Peiyao Zhang	pzhang24@jhu.edu	Needle Navigation in Retinal Microsurgery
19	Brian Kim	jkim447@jhu.edu	Autonomous Needle Insertion in Microsurgery: A First Demonstration on Pig Retinal Veins
20	Gabriel Baraban	gbaraba1@jhu.edu	Aerial Manipulation
21	Di Cao	dcao9@jhu.edu	Cerebellar Contribution to the Internal Model Control
22	Rachel Shi	rschulm3@jhu.edu	Multi-state soft machine programmed by DNA codes
23	Kapil Katyal	Kapil.Katyal@jhuapl.edu	Complex Terrain Navigation via Model Error Prediction
24	Wenhao Gu	wgu11@jhu.edu	Towards Accurate Surgical Navigation with Mixed Reality
25	Paola Ruiz Puentes	pruizpu1@jhu.edu	Pupillometry for cognitive load evaluation
26	Nathan Drenkow	ndrenko1@jhu.edu	Non-Adversarial Robustness in Deep Learning for Computer Vision
27	Yixuan Wu	yixuan_wu@jhu.edu	Listen to prostate cancer: photoacoustic imaging and beyond

Virtual Networking Event

Room	Company	Contact	Website
A	Stryker	Jared Leichner	https://careers.stryker.com/
B	OffWorld	Monica Levine	https://www.offworld.ai/
C	Neocis	Jim Tieman	https://www.neocis.com/careers/
D	Surgical Science	Anand Malpani	https://surgicalscience.com/sales/career/
E	PediaMetrix	Can Kocabalkanli	www.PediaMetrix.com
F	Kitware, Inc.	Roxanne Little	https://www.kitware.com/careers/
G	Current Surgical	Al Mashal	https://www.currentsurgical.com/careers