IULIAN IOAN IORDACHITA Ph.D.
Research Professor

Department of Mechanical Engineering
Whiting School of Engineering, Johns Hopkins University
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RESEARCH INTERESTS

Robotics / Medical Robotics / Surgical Robotics
Medical Instrumentation / Smart Surgical Tools
Image-Guided Surgery / Computer Assisted Surgery
Mechanisms and Mechanical Transmissions for Robots

EDUCATION

03/2000-08/2000:	**Post-Doctoral Fellow** in Medical Robotics, Brady Urological Institute, School of Medicine, Johns Hopkins University, Baltimore, MD, USA.
01/1992-11/1996:	**Doctor Engineer Diploma** (equivalent to **Ph.D.)** in Mechanical Engineering, University of Craiova, Romania Dissertation: *Contributions to the study of biologically inspired mechanisms for dragging locomotion.*
09/1988-06/1989:	**Diploma of Advanced Studies** (equivalent to **MS**), in Industrial Robots, University of Craiova, Romania, Thesis: *Mechanical Hands for Industrial Robots*
09/1979–06/1984:	**Mechanical Engineer Diploma** (equivalent to **BS** & **MS**), Specialization - Technology of Mechanical Engineering, University of Craiova, Romania Thesis: *Industrial Robot actuated with Pneumatic Motors*
09/1974-05/1978:	**Diploma of Baccalaureate**, “Nicolae Titulescu” High School, Craiova, Romania

PROFESSIONAL EXPERIENCE

07/2019 – cont.:	**Research Professor,** Department of Mechanical Engineering, Whiting School of Engineering, Johns Hopkins University, Baltimore, MD, USA - research activity
07/2014 – 06/2019:	**Associate Research Professor,** Department of Mechanical Engineering, Whiting School of Engineering, Johns Hopkins University, Baltimore, MD, USA - research activity
11/2009 – 06/2014:	**Assistant Research Professor,** Department of Mechanical Engineering, Whiting School of Engineering, Johns Hopkins University, Baltimore, MD, USA - research activity

07/2007 – 10/2009: **Assoc. Research Scientist,** Center for Computer-Integrated Surgical Systems and Technology, Johns Hopkins University, Baltimore, MD, USA - research activity

04/2004 – 06/2007: **Research Engineer**, Center for Computer-Integrated Surgical Systems and Technology, Johns Hopkins University, Baltimore, MD, USA - research activity

10/2003 – 03/2004: **Associate Professor**, School of Mechanical Engineering, University of Craiova, Romania – teaching and research activity

10/2002 – 09/2003: **Visiting Associate Professor**, Graduate School of Frontier Sciences, The University of Tokyo, JAPAN - research activity

10/1998 – 09/2002: **Associate Professor**, School of Mechanical Engineering, University of Craiova, Romania – teaching and research activity

10/1993 – 09/1998: **Senior Lecturer**, School of Mechanical Engineering, University of Craiova, Romania – teaching and research activity

09/1990 – 09/1993: **Assistant Professor**, School of Mechanical Engineering, University of Craiova, Romania – teaching and research activity

10/1986 – 08/1990: **Research-Design Engineer**, Research and Technology Institute for Electric Motors, Transformers and Electric Apparatus, Craiova, Romania – design and research activity

09/1984 – 09/1986: **Mechanical Engineer**, S.C. “Electroputere” SA, Craiova, Romania, Tools Factory – manufacturing process design activity

TEACHING EXPERIENCE

09.2015 – 12.2018: JHU, WSE, Mechanical Engineering Department:
- **EN.530.403, Engineering Design Project I** (part time)

02.2015 – 05.2019: JHU, WSE, Mechanical Engineering Department:
- **EN.530.404, Engineering Design Project II** (part time)

10.1998 – 03.2004: Associate Professor, School of Mechanical Engineering, University of Craiova, Romania:
- **Industrial Robots** – Course, Laboratory experiments;
- **Mechanical Structures for Robots and Manipulators** – Course, Laboratory experiments, Project, Seminar;
- **Machine Components Design** - Course, Laboratory experiments, Project;
- **Special Mechanisms and Mechanical Transmisions for Robots** - Course, Laboratory experiments, Project, Seminar;
- **Machine Design Optimization** - Course, Project, Seminar (2002-2004, new course).

10/1993 – 09/1998: Senior Lecturer, School of Mechanical Engineering, University of Craiova, Romania:
- **Industrial Robots** – Course, Laboratory experiments (new course);
- **Mechanical Structures for Robots and Manipulators** – Course, Laboratory experiments, Project, Seminar (new course);
- **Machine Components Design** - Course, Laboratory experiments, Project;
- **Mechanisms and Machines Theory** - Course, Laboratory experiments, Project, Seminar;

09/1990 – 09/1993: Assistant Professor, School of Mechanical Engineering, University of Craiova, Romania:
- **Machine Components Design** – Laboratory experiments, Project, Seminar;
- **Mechanisms and Machines Theory** – Laboratory experiments, Project, Seminar;

AWARDS

2024: Best Paper Award in Medical Robotics – Finalist (student Shervin Dehghani), ICRA 2024
2022: Best Student Paper Award (for student Junxiang Wang), ISMR 2022
2022: Best Paper Award - 2nd Place (for students Kaiyu Shi, Yishun Zhou), ISMR 2022
2020: Best Paper Award - Finalist, IEEE IROS 2020
2019: Best Paper Award in Medical Robotics, ICRA 2019
2019: Best Symposium Poster Award, ISMR 2019
2019: Best Student Paper Award (for student Shahriar Sefati), ISMR 2019
2015: Best Paper Award, IEEE MFI 2015
2014: Best Medical Application Paper Award, IEEE Sensor 2014
2014: Best Student Paper Award (for student Berk Gonenc), IEEE Sensor 2014
2014: Best Student Paper Award - Finalist (for student Xingchi He), IEEE ICRA 2014
2014: Senior Member, IEEE
2012: Best Poster Award, 2nd Place, CARS 2012
2010: Best Poster Award, Hamlyn Symposium 2010

PUBLICATIONS

Books and Textbooks

[B1] Popescu, I., **Iordachita, I.,** Dumitru, N., Rinderu, P. *Biological Mechanisms,* SITECH Publishing House, Craiova, Romania, ISBN 973-97524-9-1, 1997, (in Romanian).
[B2] **Iordachita, I.** *Special Mechanisms and Mechanical Transmissions for Industrial Robots,* University of Craiova, Publishing House, 1997, (in Romanian).
[B3] **Iordachita, I**. *Industrial Robots,* University of Craiova, Publishing House, 1997, (in Romanian).
[B4] Catrina, G., Dumitru, N., Ilie, E., **Iordachita, I.,** Margine, A., Rosca, D. *Machine Parts. Practical Applications Guide,* University of Craiova, Publishing House, 1994, (in Romanian).

Books Chapters

[B5] Tosi, D., Poeggel, S., **Iordachita, I.,** and Schena, E., "Fiber Optic Sensors for Biomedical Applications." In *Opto-Mechanical Fiber Optic Sensors*, pp. 301-333. 2018, https://doi.org/10.1016/B978-0-12-803131-5.00011-8
[B6] Vander Poorten, E., Riviere, C.N., Abbott, J.J., Bergeles, C., Nasseri, M.A., Kang, J.U., Sznitman, R., Faridpooya, K. and **Iordachita, I**., Robotic Retinal Surgery. In *Handbook of Robotic and Image-Guided Surgery* (pp. 627-672). Oct.2019. Elsevier.
[B7] Deng, Z., Xu, X., Dehghani, H., Sforza, D.M., **Iordachita, I**., Lim, M., Wong, J.W. and Wang, K.K.H., "Quantitative Bioluminescence Tomography for In Vivo Volumetric-Guided Radiotherapy." In *Biomedical Engineering Technologies. Methods in Molecular Biology,* Vol. 2393, pp. 701-731. 2022, Humana, New York, NY., https://doi.org/10.1007/978-1-0716-1803-5_38.

[B8] Roizenblatt, M., Ebrahimi, A., **Iordachita, I.** and Gehlbach, P.L., "Robotic Systems in Ophthalmologic Surgery." In *Robotic Surgery Devices in Surgical Specialties*, Cham: Springer International Publishing, pp. 161-174, Oct. 2023, https://doi.org/10.1007/978-3-031-35102-0_12.

[B9] Wang, X., Li, Y., Wu, M., Hao, Y., Tian, L., He, Z., Au, K.W.S., Taylor, R.H., **Iordachita, I**., Chan, J.Y. and Fan, J.K.M., Cheung, K.M.C., and Kwok, K.W., "Intra-operative image-guided interventional robotics—where are we now and where are we going?" In *Machine Learning, Medical AI and Robotics: Translating theory into the clinic* (pp. 7-1 to 7-31). Bristol, UK: IOP Publishing.

Journal Papers

[J1] Bernardes, M.C., Moreira, P., Lezcano, D., Foley, L., Tuncali, K., Tempany, C., Kim, J.S., Hata, N., **Iordachita, I.** and Tokuda, J., "In Vivo Feasibility Study: Evaluating Autonomous Data-Driven Robotic Needle Trajectory Correction in MRI-Guided Transperineal Procedures." *IEEE Robotics and Automation Letters*. Vol. 9. No. 10, pp. 8975 - 8982, Oct. 2024, DOI**:** 10.1109/LRA.2024.3455940

[J2] Alruwaili, F.H., Clancy, M.P., Saeedi-Hosseiny, M.S., Logar, J.A., Papachristou, C.H., Parvizi, J., **Iordachita, I.I.,** and Abedin-Nasab, M.H., "Design and Experimental Evaluation of a Leader-follower Robot-assisted System for Femur Fracture Surgery." *International Journal of Control, Automation, and Systems*, vol. 22, no. 9, pp. 2833-2846, Sep. 2024, https://doi.org/10.1007/s12555-024-0019-9

[J3] Wang, Y., Xu, Y., Kang, J., Fritz, J. and **Iordachita, I.,** "Simulation-Based Flexible Needle Control with Single-Core FBG Feedback for Spinal Injections." *IEEE Transactions on Medical Robotics and Bionics*. vol. 6, no. 3, pp. 1073-1083, Aug. 2024, DOI: 10.1109/TMRB.2024.3421630

[J4] Lezcano, D.A., Zhetpissov, Y., Bernardes, M.C., Moreira, P., Tokuda, J., Kim, J.S. and **Iordachita, I.I**., "Hybrid Deep Learning and Model-Based Needle Shape Prediction." *IEEE Sensors Journal*. vol. 24, no. 11, pp. 18359 - 18371, Apr. 2024, DOI**:** 10.1109/JSEN.2024.3386120

[J5] Zhang, P., Kim, J.W., Gehlbach, P., **Iordachita, I**., and Kobilarov, M., "Autonomous Needle Navigation in Subretinal Injections via iOCT," in *IEEE Robotics and Automation Letters*, vol. 9, no. 5, pp. 4154-4161, May 2024, doi: 10.1109/LRA.2024.3375710.

[J6] Kim, J.W., Wei, S., Zhang, P., Gehlbach, P., Kang, J.U., **Iordachita, I.** and Kobilarov, M., "Towards Autonomous Retinal Microsurgery Using RGB-D Images." *IEEE Robotics and Automation Letters*. vol. 9, no. 4, pp. 3807-3814, Apr. 2024, DOI: 10.1109/LRA.2024.3368192

[J7] Liu, D., Li, G., Wang, S., Liu, Z., Wang, Y., Connolly, L., Usevitch, D.E., Shen, G., Cleary, K. and **Iordachita, I.,** A magnetic resonance conditional robot for lumbar spinal injection: Development and preliminary validation. *The International Journal of Medical Robotics and Computer Assisted Surgery*, vol. 20, no. 1, p.e2618, (13 pages), Feb. 2024, https://doi.org/10.1002/rcs.2618

[J8] He, Z., Dai, J., Ho, J.D.L., Tong, H.S., Wang, X., Fang, G., Liang, L., Cheung, C.L., Guo, Z., Chang, H.C., **Iordachita, I.,** Taylor, R.H., Poon, W.S., Chan, D.T.M., and Kwok, K.W., "Interactive Multi-Stage Robotic Positioner for Intra-Operative MRI-Guided Stereotactic Neurosurgery." *Advanced Science*, vol. 11, no. 7, p. 2305495 (15 pages), Feb. 2024 https://doi.org/10.1002/advs.202305495

[J9] Alamdar, A., Usevitch, D.E., Wu, J., Taylor, R.H., Gehlbach, P. and **Iordachita, I.,** "Steady-hand eye robot 3.0: Optimization and benchtop evaluation for subretinal injection." *IEEE Transactions on Medical Robotics and Bionics*. Vol. 6, no. 1, pp. 135-145 Feb. 2024, https://doi.org/10.1109/TMRB.2023.3336975

[J10] Lezcano, D.A., Zhetpissov, Y., Cheng, A., Kim, J.S., **Iordachita, I.,** "Optical Fiber-Based Needle Shape Sensing in Real Tissue: Single Core vs. Multicore Approaches." *Journal of Medical Robotics Research*. Vol. 9, no. 1-2, pp. (10 pages) Mar. 2024. doi.org/10.1142/S2424905X23500046

[J11] Clancy, M., Alruwaili, F., Saeedi-Hosseiny, M., McMillan, S., **Iordachita, I.I**. and Abedin-Nasab, M., "Analysis and Optimization of a 6-DoF 3-RRPS Parallel Mechanism for Robot-Assisted Long-Bone Fracture Surgery." *Journal of Mechanisms and Robotics*, vol. 16, no. 6, p 061006 (11 pages), Jun. 2024, https://doi.org/10.1115/1.4063167

[J12] Xu, X., Deng, Z., Sforza, D., Tong, Z., Tseng, Y.P., Newman, C., Reinhart, M., Tsouchlos, P., Devling, T., Dehghani, H., **Iordachita I.,** Wong, J.W., and Wang, K.H., "Characterization of a commercial bioluminescence tomography-guided system for pre-clinical radiation research." *Medical Physics*. 2023 Aug 26., https://doi.org/10.1002/mp.16669

[J13] Wang, J., Wu, T., **Iordachita, I.** and Kazanzides, P., "Calibration and Evaluation of a Motion Measurement System for PET Imaging Studies." *Journal of Medical Robotics Research*. Vol. 08, no. 01 and 02, p. 2340003 (10 pages) Jun. 5, 2023, https://doi.org/10.1142/S2424905X23400032

[J14] Amirkhani, G., Goodridge, A., Esfandiari, M., Phalen, H., Ma, J.H., **Iordachita, I**. and Armand, M., "Design and Fabrication of a Fiber Bragg Grating Shape Sensor for Shape Reconstruction of a Continuum Manipulator." *IEEE Sensors Journal*. vol. 23, no. 12, pp. 12915-12929, Jun. 2023. DOI: 10.1109/JSEN.2023.3274146

[J15] Saeedi-Hosseiny, M.S., Alruwaili, F., Clancy, M.P., Corson, E.A., McMillan, S., Papachristou, C., Bouaynaya, N., **Iordachita, I.I**. and Abedin-Nasab, M.H., "Automatic Alignment of Fractured Femur: Integration of Robot and Optical Tracking System." *IEEE Robotics and Automation Letters*. Vol. 8. No. 5, pp. 2438-2445, May 2023, DOI**:** 10.1109/LRA.2023.3251198

[J16] Ghazi, P., Fu, G., Ghazi, T., Kazanzides, P., **Iordachita, I**. "Narrow Beam Breast CT: Proof-of-concept." *Medical Physics*. Vol. 50, no. 6, pp. 3418-3434, Jun. 2023. https://doi.org/10.1002/mp.16332

[J17] Wang, Y., Kwok, K.W., Cleary, K., Taylor, R.H., and **Iordachita, I.I.**, "Flexible Needle Bending Model for Spinal Injection Procedures." In *IEEE Robotics and Automation Letters*, vol. 8, no. 3, pp. 1343-1350, Mar. 2023, DOI**:** 10.1109/LRA.2023.3239310

[J18] Zhou, M., Hennerkes, F., Liu, J., Jiang, Z., Wendler, T., Nasseri, M.A., **Iordachita, I.** and Navab, N., "Theoretical error analysis of spotlight-based instrument localization for retinal surgery." *Robotica*, pp.1-14. Jan. 2023 https://doi.org/10.1017/S0263574722001862

[J19] Alruwaili, F., Saeedi-Hosseiny, M.S., Clancy, M., McMillan, S., **Iordachita, I.I.** and Abedin-Nasab, M.H., "Experimental Evaluation of a 3-Armed 6-DOF Parallel Robot for Femur Fracture Surgery." *Journal of Medical Robotics Research*, p.2241009. Dec. 2022, https://doi.org/10.1142/S2424905X22410094

[J20] Lezcano, D.A., **Iordachita, I.I.** and Kim, J.S., "Lie-Group Theoretic Approach to Shape-Sensing Using FBG-Sensorized Needles Including Double-Layer Tissue and S-Shape Insertions." *IEEE Sensors Journal*. vol. 22, no. 22, pp. 22232- 22243, Oct. 2022, DOI: 10.1109/JSEN.2022.3212209

[J21] Ji, T., Feng, Z., Sun, E., Ng, S.K., Su, L., Zhang, Y., Han, D., Han-Oh, S., **Iordachita, I.,** Lee, J., Kazanzides, P., Bell, M.A.L., Wong, J., Ding, K. "A phantom-based analysis for tracking intra-fraction pancreatic tumor motion by ultrasound imaging during radiation therapy." *Front Oncol.* vol.12, p: 996537. Sep. 2022, DOI: 10.3389/fonc.2022.996537.

[J22] Patel, N., Urias, M., Ebrahimi, A., Taylor, R.H., Gehlbach, P. and **Iordachita, I**., "Force-Based Control for Safe Robot-Assisted Retinal Interventions: In Vivo Evaluation in Animal Studies." *IEEE Transactions on Medical Robotics and Bionics*, vol.4, no. 3, pp.578-587, Aug. 2022, DOI: 10.1109/TMRB.2022.3191441,

[J23] Deng, Z., Xu, X., **Iordachita, I.,** Dehghani, H., Zhang, B., Wong, J.W. and Wang, K.K.H., "Mobile bioluminescence tomography-guided system for pre-clinical radiotherapy research." *Biomedical Optics Express*, vol.13, no. 9, pp.4970-4989. Sep. 2022, DOI: 10.1364/BOE.460737

[J24] Ebrahimi, A., Sefati, S., Gehlbach, P., Taylor, R.H. and **Iordachita, I.I**., "Simultaneous Online Registration-Independent Stiffness Identification and Tip Localization of Surgical Instruments in Robot-Assisted Eye Surgery." *IEEE Transactions on Robotics*. Vol. xx, no. x, On-line Sep 9, 2022, DOI: 10.1109/TRO.2022.3201393

[J25] **Iordachita, I.I**., de Smet, M.D., Naus, G., Mitsuishi, M., and Riviere, C.N., "Robotic Assistance for Intraocular Microsurgery: Challenges and Perspectives," in *Proceedings of the IEEE*, vol. 110, no. 7, pp. 893-908, Jul. 2022, DOI: 10.1109/JPROC.2022.3169466.

[J26] Sommersperger, M., Martin-Gomez, A., Mach, K., Gehlbach, P.L., Nasseri, M.A., **Iordachita, I**. and Navab, N., "Surgical scene generation and adversarial networks for physics-based iOCT synthesis." *Biomedical Optics Express*, vol. 13, no. 4, pp. 2414-2430, Apr. 2022, https://doi.org/10.1364/BOE.454286

[J27] Su, H., Kwok, K.W., Cleary, K., **Iordachita, I**., Cavusoglu, M.C., Desai, J.P., and Fischer, G.S., "State of the Art and Future Opportunities in MRI-Guided Robot-Assisted Surgery and Interventions." *Proceedings of the IEEE*. vol. 110, no. 7, pp. 968-992, Jul. 2022, DOI: 10.1109/JPROC.2022.3169146.

[J28] Saeedi-Hosseiny, M.S., Alruwaili, F., McMillan, S., **Iordachita, I**. and Abedin-Nasab, M.H., "A Surgical Robotic System for Long-Bone Fracture Alignment: Prototyping and Cadaver Study." *IEEE Transactions on Medical Robotics and Bionics*. vol. 4, no. 1, pp.172-182, Feb. 2022, DOI: 10.1109/TMRB.2021.3129277

[J29] Alamdar, A., Patel, N., Urias, M.G., Ebrahimi, A., Gehlbach, P.L. and **Iordachita, I.,** "Force and Velocity Based Puncture Detection in Robot Assisted Retinal Vein Cannulation: in-vivo Study". *IEEE Transactions on Biomedical Engineering*. vol. 69, no. 3, pp.1123-1132, Mar. 2022, DOI: 10.1109/TBME.2021.3114638

[J30] Xu, X., Deng, Z., Dehghani, H., **Iordachita, I.**, Lim, M., Wong, J.W. and Wang, K.K.H., "Quantitative Bioluminescence Tomography-guided Conformal Irradiation for Pre-clinical Radiation Research". *International Journal of Radiation Oncology* Biology* Physics*., vol. 111, no. 5, pp 1310-1321, Dec. 2021, https://doi.org/10.1016/j.ijrobp.2021.08.010

[J31] Zhou, M., Wu, J., Ebrahimi, A., Patel, N., Liu, Y., Navab, N., Gehlbach, P., Knoll, A., Nasseri, M.A. and **Iordachita, I.I**., "Spotlight-based 3D Instrument Guidance for Autonomous Task in Robot-assisted Retinal Surgery". In *IEEE Robotics and Automation Letters*, vol. 6, no. 4, pp. 7750-7757, Jul. 2021 doi:10.1109/LRA.2021.3100937

[J32] Sefati, S., Hegeman, R., **Iordachita, I.**, Taylor, R.H. and Armand, M., "A Dexterous Robotic System for Autonomous Debridement of Osteolytic Bone Lesions in Confined Spaces: Human Cadaver Studies." *IEEE Transactions on Robotics*. vol. 38, no. 2, pp. 1213- 1229, Apr. 2022, doi: 10.1109/TRO.2021.3091283.

[J33] Patel, N., Yan, J., Li, G., Monfaredi, R., Priba, L., Donald-Simpson, H., Joy, J., Dennison, A., Melzer, A., Sharma, K., **Iordachita, I.I.**, and Cleary, K., "Body-mounted Robotic System for MRI-guided Shoulder Arthrography: Cadaver and Clinical Workflow Studies

MRI-guided Robot for Shoulder Arthrography." *Frontiers in Robotics and AI*, vol.8, 10 pages, art. # 667121, May 2021. https://doi.org/10.3389/frobt.2021.667121

[J34] Jinno, M. and **Iordachita, I**., "Improved Integrated Robotic Intraocular Snake: Analyses of the Kinematics and Drive Mechanism of the Dexterous Distal Unit." *Journal of Medical Robotics Research*. vol. 06, no.01n02, pp.1-13, p. 2140001, May 2021, https://doi.org/10.1142/S2424905X21400018.

[J35] Ebrahimi, A., Urias, M., Patel, N., Taylor, R.H., Gehlbach, P.L. and **Iordachita, I**., "Adaptive Control Improves Sclera Force Safety in Robot-Assisted Eye Surgery: A Clinical Study." *IEEE Transactions on Bio-Medical Engineering*. vol. 68, no.11, pp.3356-3365, Nov. 2021, DOI: 10.1109/TBME.2021.3071135

[J36] Rezaee, M., **Iordachita, I**. and Wong, J.W., "Ultrahigh dose-rate (FLASH) X-Ray irradiator for pre-clinical laboratory research." *Physics in Medicine & Biology*. vol. 66, no. 9, pp.1-10, p. 095006, Apr. 2021, https://doi.org/10.1088/1361-6560/abf2fa

[J37] Dai, J., He, Z., Fang, G., Wang, X., Li, Y., Cheung, C.L., Liang, L., **Iordachita, I.I**., Chang, H.C. and Kwok, K.W., "A Robotic Platform to Navigate MRI-guided Focused Ultrasound System." *IEEE Robotics and Automation Letters*. vol. 6, no. 3, pp.5137-5144, Jul. 2021, DOI: 10.1109/LRA.2021.3068953

[J38] Sommersperger, M., Weiss, J., Nasseri, M.A., Gehlbach, P., **Iordachita, I**. and Navab, N., "Real-time tool to layer distance estimation for robotic subretinal injection using intraoperative 4D OCT." *Biomedical Optics Express*, vol.12, no.2, pp.1085-1104. Feb. 12, 2021, https://doi.org/10.1364/BOE.415477

[J39] Li, G., Patel, N.A., Sharma, K., Monfaredi, R., Dumoulin, C., Fritz, J., **Iordachita, I**. and Cleary, K., "Body-Mounted Robotics for Interventional MRI Procedures." *IEEE Transactions on Medical Robotics and Bionics*, vol. 2, no. 4, pp.557-560, On-line 13 Oct. 2020, DOI: 10.1109/TMRB.2020.3030532

[J40] Sefati, S., Gao, C., **Iordachita, I**., Taylor, R.H. and Armand, M., 2020. Data-Driven Shape Sensing of a Surgical Continuum Manipulator Using an Uncalibrated Fiber Bragg Grating Sensor. *IEEE Sensors Journal*. vol. xx, no. x, pp.1-12, On-line 01 Oct. 2020, DOI: 10.1109/JSEN.2020.3028208

[J41] Ebrahimi, A., Alambeigi, F., Sefati, S., Patel, N., He, C., Gehlbach, P.L. and **Iordachita, I**., "Stochastic Force-based Insertion Depth and Tip Position Estimations of Flexible FBG-Equipped Instruments in Robotic Retinal Surgery." *IEEE/ASME Transactions on Mechatronics*. vol. 26, no. 3, pp.1512-1523, Jun. 2021, DOI: 10.1109/TMECH.2020.3022830

[J42] Sefati, S., Hegeman, R., Alambeigi, F., **Iordachita, I.**, Kazanzides, P., Khanuja, H., Taylor, R. and Armand, M., "A Surgical Robotic System for Treatment of Pelvic Osteolysis Using an FBG-Equipped Continuum Manipulator and Flexible Instruments." *IEEE/ASME Transactions on Mechatronics*., vol. xx, no. x, pp.1-12, On-line 30 Aug. 2020, DOI: 10.1109/TMECH.2020.3020504

[J43] Urias, M.G., Patel, N., Ebrahimi, A., **Iordachita, I**. and Gehlbach, P.L., "Robotic Retinal Surgery Impacts on Scleral Forces: In Vivo Study." *Translational Vision Science & Technology*, vol. 9, no. 10, pp. 109, Sep. 2020, https://doi.org/10.1167/tvst.9.10.2

[J44] Lo Presti, D., Massaroni, C., Leitão, C.S.J., Domingues, M.F., Sypabekova, M., Barrera, D., Floris, I., Massari, L., Oddo, C.M., Salvador Sales, S., **Iordachita, I.I**., Daniele Tosi, D., Emiliano Schena, E., "Fiber Bragg Gratings for medical applications and future challenges: a review," in IEEE Access, vol. 8, pp. 156863-156888, Sep. 2020, DOI: 10.1109/ACCESS.2020.3019138

[J45] Tsumura, R., **Iordachita, I**. and Iwata, H., Fine-Needle Insertion Method for Minimizing Deflection in Lower-Abdomen: In Vivo Evaluation. *The International Journal of Medical Robotics and Computer Assisted Surgery*, p.e2139. vol. 16, no. 6, pp.1-12, Dec. 2020, https://doi.org/10.1002/rcs.2139

[J46] Li, G., Patel, N., Melzer, A., Sharma, K., **Iordachita, I.I,** and Cleary, K., "MRI-guided lumbar spinal injections with body-mounted robotic system: cadaver studies." Minimally Invasive Therapy & Allied Technologies, vol. 31, no. 2, pp.297-305, Feb. 2022, DOI: 10.1080/13645706.2020.1799017

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[A66] Ford, E., Kennedy, C.W., McNutt, T., Armour, E., **Iordachita, I**., Kazanzides, P., Wong, J., "The Small Animal Radiation Research Platform: Benchtop Cone-Beam CT," *AAPM 48th Annual Meeting, Conference of American Association of Physicists in Medicine,* Orlando, FL, Journal of Medical Physics, Jul. – Aug. 2006.

[A67] Deng, H., Kennedy, C.W., Armour, E., McNutt, T., Tryggestad, E., Ford, E., **Iordachita, I.**, Kazanzides, P., Huang, J., Wong, J., "The Small-Animal Radiation Research Platform (SARRP): Focused Pencil Beam Dosimetry," *AAPM 48th Annual Meeting, Conference of American Association of Physicists in Medicine,* Orlando FL, Journal of Medical Physics, Jul. – Aug. 2006.

[A68] Tryggestad, E., Armour, E., Deng, H., Ford, E., Huang, J., **Iordachita, I**., Kazanzides, P., Kennedy, C.W., McNutt, T., Verhaegen, F., Wong, J., "The Small-Animal Radiation Research Platform (SARRP): Commissioning a 225 KVp "small-Field" X-Ray Source for Monte Carlo-Based Treatment Planning," *AAPM 48th Annual Meeting, Conference of American Association of Physicists in Medicine,* Orlando, FL, Journal of Medical Physics,

Jul. – Aug. 2006.

[A69] Li, J.C., **Iordachita, I.**, Balogh, E., Fichtinger, G., Kazanzides, P., "Validation of an Image-Guided Robot System for Measurement, Biopsy and Injection in Rodents," *Proc. IEEE 31st Annual Northeast Bioengineering Conf.,* Hoboken, NJ, pp. 131-133, Apr. 2005.

[A70] Roberts, W., **Iordachita, I**., Patriciu, A., Mazilu, D., Jarrett, T.W., Kavoussi, L., and Stoianovici, D., "Quantifiable Tests of Laparoscopic Dexterity: Robotic Versus Manual Laparoscopy," *Proc. Society for Urology and Engineering, 16th Annual Meeting,* Anaheim, CA, 2001.

[A71] **Iordachita I**., "Considerations over the Kinematics of Mechanisms that Provide Snake-like Locomotion," *XXII-th Yugoslav Congress of Theoretical and Applied Mechanics, YUCTAM'97,* Vrnjacka Banja, Yugoslavia, 1997.

Other Papers

[O1] Bohren, J., **Iordachita, I.**, Whitcomb, L.L., "Toward a Fully Actuated MRI-Compatible Robotic Device for MRI-Guided Transrectal Prostate Intervention," *Fourth NCIGT and NIH Image Guided Therapy Workshop,* 2011.

[O2] Song, S., Cho, N., Tokuda, J., Hata, N., Tempany, C., Fichtinger, G., **Iordachita, I**., "MRI compatibility study of a pneumatically actuated robotic system for transperineal prostate needle placement," *3rd Annual Image-Guided Therapy Workshop*, Arlington, VA, Mar. 2010.

[O3] Fischer, G.S., **Iordachita, I**., U-Thainual, P., Carrino, J.A., Fichtinger, G., "A Training Suite for Image Overlay and other Needle Insertion Techniques," *2008 MICCAI Workshop - Augmented Environments for Medical Imaging and Computer-Aided Surgery (AMI-ARCS),* Sep. 2008.

[O4] Krieger, A., Guion, P., Csoma, C., **Iordachita, I**., Singh, A.K., Kaushal, A., Whitcomb, L.L., Fichtinger, G., "MRI Guided Prostate Biopsy and Marker Placements," *Workshop on Clinical Image-Guided Therapy: Opportunities and Needs,* Rockville, Maryland, Mar. 2008.

[O5] Song, D., Deguet, A., Jain, A., Armour, E., Le, Y., Blevins, J., **Iordachita, I**., Burdette, E.C., Fichtinger, G., "Registered Ultrasound and Fluoroscopy for Intraoperative Dynamic Dosimetry in Prostate Brachytherapy," *Workshop on Clinical Image-Guided Therapy: Opportunities and Needs,* Rockville, Maryland, Mar. 2008.

[O6] Fichtinger, G, Fiene, J., Kennedy, C., **Iordachita, I.**, Kronreif, G., Song, D.Y., Burdette, E.C., Kazanzides, P., "Robotic Assistance for Ultrasound Guided Prostate Brachytherapy," *Workshop on Clinical Image-Guided Therapy: Opportunities and Needs,* Rockville, Maryland, Mar. 2008.

[O7] Fichtinger, G, Fiene, J., Kennedy, C., **Iordachita, I**., Kronreif, G., Song, D.Y., Burdette, E.C., Kazanzides, P., "Robotic Assistance for Ultrasound Guided Prostate Brachytherapy," *The Fourth AdMeTech Foundation Conference: Ending the Era of Blind Cancer Care & Creating a Future of Image-Guided, Minimally Invasive Diagnosis & Treatment.* Washington, DC, Sep. 2007.

[O8] Catrina, G., **Iordachita, I**., Margine, A., "The Linear Trajectory Precision for Industrial Robots," *Third International Conference on Electro-mechanic and Energetic Systems (SIELMEN-2001),* ISBN 9975-9638-8-9, Chisinau, Moldova, Vol. III, pp. 207-210, 2001.

[O9] **Iordachita, I**., Stoianovici, D., Catrina, G., "A Mechanism for Rotation and Insertion of the Needles Used in Medical Procedures," *Third International Conference on Electro-mechanic and Energetic Systems (SIELMEN-2001),* ISBN 9975-9638-8-9, Chisinau, Moldova, Vol. III, pp. 203-206, 2001.

[O10] Catrina, G., **Iordachita, I**., Popa, D., "Consideration over the Optimal Design of Elements of Machines," *1st Conference with International Participation of the Millennium: The Auto vehicle*

– *Safety, Comfort and Durability (SMAT 2001),* Craiova, Romania, ISBN 973-8043-23-4, vol. I, pp. 331-336, 2001. (in Romanian)

[O11] **Iordachita, I**., "Considerations over the Mechanisms that Provide Snake-like Locomotion," *The 2nd National Workshop on Mobile Robots (WMRC-2001),* Craiova, Romania, ISBN 973-8043-39-5, 2001. (in Romanian)

[O12] Tudor, M., **Iordachita, I**., "Studies on the Bio-mechanisms for Walking with Creeping Locomotion with Applicability of Mobile Robots," *The 2nd National Workshop on Mobile Robots (WMRC-2001),* Craiova, Romania, ISBN 973-8043-39-5, 2001. (in Romanian)

[O13] **Iordachita I**., "Realizations regarding the robot-mechanisms for dragging locomotion," *The 4th Conference New Technologies and Designing Methods in Mechanical Engineering (INGMEC'98),* Craiova, Romania, ISSN 1223-5296, Vol. I, pp. 405-410, 1998. (in Romanian)

[O14] **Iordachita, I**., "Aspects Regarding the Inverse-Kinematics of the Dragging Locomotion Mechanisms," *Proceedings of the Scientific Communications Meeting of "Aurel Vlaicu" University, Third Edition,* Arad, Romania, vol. III, pp. 49-54, 1996. (in Romanian)

[O15] **Iordachita, I.**, Margine A., "Dragging Locomotion Mechanisms – An Experimental Model," *Proceedings of the Scientific Communications Meeting of "Aurel Vlaicu" University, Third Edition,* Arad, Romania, vol. III, pp. 55-60, 1996. (in Romanian)

[O16] **Iordachita, I.**, "Contributions about Kinematics of Dragging Locomotion Mechanisms," *Proceedings of the Scientific Communications "The Scientific Research Implication in Development and Modernization of Processing Methods",* Sibiu, Romania, pp. 209-214, 1995. (in Romanian)

[O17] **Iordachita, I.**, "Kinematics of the Dragging Locomotion Mechanisms," *3rd International Scientific Conference "Modern Machines and Technologies", MTeM'95,* Cugir, Romania, 1995. (in Romanian)

[O18] Georgescu, S., **Iordachita, I**., "Software Package for the Masses Calculus of Tubes Presenting Ribs," *National Symposium PRASIC'94,* Brasov, Romania, pp. ,61-68, 1994 (in Romanian)

[O19] **Iordachita, I.**, "About the Structure of Locomotion Dragging Mechanisms," *3rd National Conference of Technologies and Numerical Drawing Methods in Engineering,* Craiova, Romania, vol. II, pp. 258-265, 1994. (in Romanian)

[O20] **Iordachita, I.**, Dumitru, N., "Locomotion Systems for Digging Tunnel Machine based on Bionics Principles," *VI-th National Symposium on MTM.* Timisoara, Romania, vol. 1, MTM paper #41, 1992. (in Romanian)

[O21] Dumitru, N., **Iordachita, I.**, "Algorithm for Gearing Mechanisms Study," *VI-th National Symposium on MTM,* Timisoara, Romania, vol. 2 MTM, paper #32, 1992. (in Romanian)

[O22] Catrina, G., Radulescu, M., **Iordachita, I**., Margine, A., Bogdan, R., "Stand for testing of Differential Transmissions Screw-nut," *VI-th National Symposium on MTM,* Timisoara, Romania, vol. 2 MTM, paper #47, 1992. (in Romanian)

[O23] **Iordachita, I.**, Sabau, A., "Working Space Volume Calculus for the RD5NT Robot using the Monte Carlo Method," *Proceedings of the Scientific Communications "Conception, Technology and Management in Engineering,"* Iasi, Romania, pp.123-128, 1992. (in Romanian)

PRESENTATIONS

Conferences and Workshops (excluding paper presentations)

[T1] "Optimized Manipulator for in-bore MRI-guided Trasperineal Prosate Biopsy," invited talk to *Workshop on Robotics Microsurgery and Image-Guided Surgical Interventions*, IEEE BioRob 2014, SaoPaulo, Brazil, August 12th, 2014.

[T2] "Robot-assisted retinal microsurgery: current challenges and future perspectives," 16th EURETINA Congress, Bella Center, Copenhagen, Denmark, September 11th, 2016.

[T3] "Optical Fiber-based Sensorized Instraumentsfor Robot-Assisted Surgery," invited talk to *Workshop on Current and Future Chalanges in Robotics Research for Biomedical Applications*, IEEE EMBC 2017, Jeju Island, South Korea, July 11th, 2017.

[T4] "Fundamentals of Engineering to Understand Robotic Surgery," 17th EURETINA Congress, CCIB, Barcelona, Spain, September 9th, 2017.

[T5] "Dexterous Continuum Manipulators for Robot-Assisted Surgery," invited talk to *Workshop on Continuum Robots in Medicine – Design, Integration, and Applications*, IEEE IROS 2017, Vancouver, Canada, Septemeber 24th, 2017.

[T6] "Safe Tissue Manipulation in Retinal Microsurgery via Motorized Instruments with Force Sensing," invited talk to *Focused Session – Sensor for Medical Robotics*, IEEE SENSORS 2017, Glasgow, Scotland, UK, October 31st, 2017.

[T7] "Safe Tissue Manipulation in Retinal Microsurgery via Force Sensing Instruments," invited semi-plenary talk to *International Symposium on Medical Robotics*, ISMR 2018, Atlanta, GA, March 1st, 2018.

[T8] "Enabling Technology for Safe Robot-Assisted Vitreoretinal Surgery," invited talk to *2nd workshop on Advances in Image-Guided Ophthalmic Interventions,* Hamlyn Symposium 2018, London, UK, June 24th, 2018.

[T9] "Robot-Assisted Retinal Surgery," invited keynote speech to *25th Edition of World Congress of Ophthalmologist,* London, UK, November 8th, 2018.

[T10] "Safe Robot-Assisted Retinal Surgery," invited talk to Workshop Robot-Assisted Eye Surgery: Steps Toward Operating Room, *International Symposium on Medical Robotics*, ISMR 2019, Atlanta, GA, April 3rd, 2019.

[T11] "Shape Sensing Based Navigation of Flexible Medical Devices," invited talk to Symposium "Advanced in Device Navigation", *Society for Image-Guided Neurointerventions 2019 Conference* (SIGN 2019), Baltimore, MD, June 10th, 2019.

[T12] "Toward Intelligent Robotic Assistance for Safe Manipulation in Retinal Surgery" invited talk to Cutting Edge Forum "Surgical Robotics with AI", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), November 6th, 2019, Macau, CHINA

[T13] "Safe Robot-Assisted Retinal Surgery," invited talk to Workshop "Autonomous System in Medicine: Current Challenges in Design, Modeling, Perception, Control and Applications" IROS 2020, October 25th, 2020, (virtual)

[T14] "Enabling Technology for Safe Robot-Assisted Retinal Surgery," invited keynote speech to *1st International Conference on Advanced Research in Engineering*, CARE 2020, Craiova, Romania, October 30th, 2020. (virtual)

[T15] "Shape-Sensing for Dexterous Continuum Manipulators," invited talk to Workshop "Holistic Integration of Design, Sensing, and Intelligence in Dexterous Medical Robotics Systems" ICRA 2021, June 4th, 2021 (virtual)

[T16] "Shape Sensing Based Navigation of Flexible Medical Devices," invited talk to ISMR 2021 Workshop on "Sensing and Feedback in Dexterous Medical/Surgical Robotics", November 17th, 2021, Georgia Tech, Atlanta, GA, USA

[T17] "Needle Shape Detection for Interventional MRI," invited talk to ISMR 2021 Workshop on "Improving clinical outcomes of image-guided needle-based interventions: development and clinical translation of new approaches", November 17th, 2021, Georgia Tech, Atlanta, GA, USA

[T18] "Shape-Sensing and Prediction using FBG-Sensorized Needles" invited talk to the 12th National Image Guided Therapy Workshop, May 19, 2022 (virtual)

[T19] "Sensor-based Technology for Safe Robot-assisted Retinal Surgery," invited talk to Workshop "ARVOS – Advanced Robotics and visualization for Ophthalmic Surgery", IROS 2022, October 23rt, 2022, Kyoto, Japan

[T20] "AI-based Technology for Safe Robot-assisted Retinal Surgery," invited talk to Workshop "A Panacea or an Alchemy? – Benefits and Risks of Robot Learning in Medical Applications", IROS 2022, October 27th, 2022, Kyoto, Japan

[T21] "Needle Shape Detection for Interventional MRI," invited talk to ISMR 2023 Workshop on "Recent progress in MRI-guided robotics", April 19th, 2023, Georgia Tech, Atlanta, GA, USA

[T22] "Enabling Technology for Safe Robot-Assisted Retinal Surgery" invited talk to Workshop "Force and Shape Perception for Surgical Instruments and Robots", ICRA 2023, June 2nd, ExCel, London, UK

[T23] "Enabling Technology for Safe Robot-Assisted Retinal Surgery," invited keynote speech to *8th International Workshop on New Trends in Medical and Service Robotics*, MESROB 2023, Craiova, Romania, June 7th, 2023. (virtual)

[T24] "Enabling Technology for Autonomous Robotic Retinal Surgery" invited talk to the Multi-Scale Medical Robotics Center (MRC) Symposium 2024, MRC, Hong Kong, SAR, China, May 10th, 2024

[T25] "Enabling Technology for Autonomous Robotic Retinal Surgery" invited talk to 2nd Workshop "Machine Learning in Medical Robotics: Bringing ML Theory and Clinical Frontiers", IROS 2024, October 14th, 2024, Abu Dhabi, UAE

[T26] "Toward Autonomous Retinal Surgery," invited talk to Workshop "ARVOS – Advanced Robotics and visualization for Microsurgery", IROS 2024, October 14th, 2024, Abu Dhabi, UAE

[T27] "Enabling Technology for Autonomous Robotic Retinal Surgery," invited keynote speech to Research Gala 2024 – University of Craiova, Craiova, Romania, November 29th, 2024. (virtual)

Invited University Colloquia and Seminars

[T28] "Robot-assisted retinal microsurgery: current challenges and future perspectives," Worcester Polytechnic Institute, Worcester, MA, USA, December 5th, 2014.

[T29] "Optical Fiber-based Sensorized Instruments for Robot-Assisted Surgery," SPL, Brigham and Women's Hospital, Boston, MA, USA, March 23rd, 2016

[T30] "Safe Robot-Assisted Retinal Surgery," LCSR Seminar, JHU, Baltimore, MD. USA, April 17th, 2019

[T31] "Enabling Technology for Safe Robot-assisted Retinal Surgery," Rowan University, Henry M. Rowan College of Engineering, Glassboro, NJ, USA, October 22nd, 2020. (virtual)

[T32] "Sensor-based Technology for Safe Robot-assisted Retinal Surgery," Seminar, Dept. of Computer and Software Engineering, Institute of Biomedical Engineering, Polytechnique Montréal, Quebec, Canada, March 22nd, 2021, (virtual)

[T33] "Sensor-based Technology for Safe Robot-assisted Retinal Surgery," Seminar, 2021 Fall School on Medical Robotics, Georgia Institute of Technology, Atlanta, GA, USA, November 16th, 2021 (virtual)

[T34] "Enabling Technology for Safe Robot-assisted Retinal Surgery," MRC, The Chinese University of Hong Kong, Hong Kong, SAR, China, March 16th, 2023.

[T35] "Enabling Technology for Safe Robot-assisted Retinal Surgery" Seminar, 2023 Spring School on Medical Robotics, Georgia Institute of Technology, Atlanta, GA, USA, April 18th, 2023.

[T36] "Enabling Technology for Safe Robot-assisted Retinal Surgery" Seminar, Guest Lecture – Computer Integrated Surgery I, Johns Hopkins University, Baltimore, MD, USA, November 30th, 2023.

[T37] "Toward Autonomous percutaneous Interventions with Sensorized Needles " Seminar, Guest

Lecture – Computer Integrated Surgery I, Johns Hopkins University, Baltimore, MD, USA, November 21st, 2024.

RESEARCH FUNDING AND SUPPORT

Current:

1. Title: Multi-Scale Medical Robotics Center.
Dates: 6/01/2020-5/31/2025
Grantor: Chinese University of Hong Kong
Grant #: Multi-Scale Medical Robotics Center (Russell Taylor, PI)
Institution: Johns Hopkins University
Amount: $2,500,000 (JHU total)
Summary: JHU's role focuses on image-guided robotic interventions with the development of image-based automation in robotic surgery, high performance robotic systems for intra-operative MRI-guided interventions, image-guided robotic platform for minimally invasive orthopedic surgery, and a low-cost surgical robotic arm system for universal surgeries
Role: Co-Investigator

2. Title: Enabling Dexterous Intraocular Surgery with Robotic Assistance.
Dates: 2/01/2024-1/31/2027
Grantor: National Institutes of Health
Grant #: R01 EB034397-01A1 (Iulian Iordachita, PI)
Institution: Johns Hopkins University
Amount: $1,230,856 (Total)
Summary: The goal of this project is to develop and evaluate a high-dexterity clinically compatible surgical platform for assisting ophthalmologists in providing therapy in the retinal domain.
Role: Principal Investigator

3. Title: Robot-assisted catheter placement with novel shape-sensing stylet to facilitate adaptive image guided pelvic brachytherapy
Dates: 07/01/2024-06/30/2028
Grantor: NIH, NCI
Grant #: 1R01EB036015-01 (Junichi Tokuda, PI)
Institution: BWH, subcontract Johns Hopkins University
Amount: $ 3,387,458 (Total)
Summary: The goal of this project is to develop and evaluate a new technology to facilitate catheter navigation under MRI for adaptive image-guided pelvic brachytherapy.
Role: Principal Investigator (of Johns Hopkins University sub-contract, MPI)

4. Title: Adaptive Percutaneous Prostate Interventions using Sensorized Needle.
Dates: 8/01/2019-1/29/2028
Grantor: National Institutes of Health
Grant #: 1R01 CA235134-01 and 2R01CA235134-04 (Junichi Tokuda, PI)
Institution: BWH, subcontract Johns Hopkins University
Amount: $2,465,224 (Total)
Summary: Develop and validate optical fiber-based shape-sensing needle that can detect the deviation of needle in vivo and feed it back to the physician in real-time.
Role: Principal Investigator (of Johns Hopkins University sub-contract, MPI)

5. Title: X-ray/optical tomographic guidance and assessment for pre-clinical radiation research
Dates: 6/01/2019-6/30/2025
Grantor: National Institutes of Health

Grant #: 1R37 CA230341-01 (Ken Wang, PI)
Institution: UTSW
Amount: $314,480 (Total)
Summary: Advance the in vivo cancer imaging capability of SARRP to include quantitative bioluminescence and fluorescence tomography.
Role: Co-Investigator

6. Title: Enabling Technology for Safe Robot-assisted Surgical Micromanipulation
Dates: 4/01/2022-12/31/2025
Grantor: National Institutes of Health
Grant #: 2R01EB023943-04A1 (Iulian Iordachita, MPI)
Institution: Johns Hopkins University
Amount: $1,579,353 (Total)
Summary: The goal of this project is to develop and evaluate enabling technology for safe and reliable bilateral, semi-autonomous robotic assistance integrated with force sensing instruments to assist the surgeon with sensorimotor guidance for safe retinal vein cannulation.
Role: Principal Investigator

7. Title: An ultra-high (FLASH) dose rate x-ray cabinet system for pre-clinical laboratory radiation research
Dates: 08/01/2021-07/31/2025
Grantor: National Institutes of Health
Grant #: 1R01CA262097-01 (Rezaee, Mohammad, PI)
Institution: Johns Hopkins University, JHMI
Amount: $2,140,785 (Total)
Summary: The goal of this project is to develop a self-shield kilovoltage x-ray cabinet system with the capabilities of delivering both FLASH and conventional dose-rate irradiations for preclinical laboratory research.
Role: Co-Investigator

8. Title: Image-Guided Surgical Robotic System for Femur Fracture Reduction
Dates: 05/01/2024-04/30/2028
Grantor: National Institutes of Health
Grant #: 1R 01EB036365 (Abedin-Nasab, Mohammad, PI)
Institution: Rowan University, NJ
Amount: $1,802,454 (Total)
Summary: The goal of this project is to develop and evaluate a clinical grade robotic system for treating femoral shaft fractures, providing mechanical assistance to the clinician for bone gripping, positioning, and highly accurate alignment of the bone fragments.
Role: Co-PI

Completed:

9. Title: Automating mosquito microdissection for a malaria PfSPZ vaccine
Dates: 07/01/2021-06/30/2025
Grantor: NIH SBIR (Subcontract from Sanaria)
Grant #: R44 AI134500-01(Russell Taylor, PI)
Institution: Johns Hopkins University
Amount: $ 1,134,960 (Total)
Summary: This project builds upon our earlier and ongoing collaboration with Sanaria in developing production processes for a malaria vaccine. JHU's roles include assisting in translation of our previously developed prototypes into GMP production and in developing a fully automated robotic system to increase production.
Role: Co-Investigator

10. Title: Surgical Robotic System for Long-Bone Fracture Reduction

Dates: 02/15/2022-01/31/2024
Grantor: National Science Foundation
Grant #: NSF-PFI 2141099 (Abedin-Nasab, Mohammad, PI)
Institution: Rowan University, NJ
Amount: $249,999 (Total)
Summary: The goal of this project is to develop and evaluate a robotic system for treating femoral shaft and hip fractures, providing mechanical assistance to the clinician for bone gripping, positioning, and highly accurate alignment of the bone fragments.
Role: Co-Investigator

11. Title: MRI Compatible Robot for Improved Pain Injections in Adults and Children.
Dates: 6/01/2018-2/28/2024
Grantor: National Institutes of Health
Grant #: 1 R01 EB025179-01 (Kevin Cleary, PI)
Institution: Children's National Medical Center, subcontract Johns Hopkins University
Amount: $1,169,857 (JHU total)
Summary: Develop and evaluate a patient-mounted MRI-compatible robot for needle guidance for pain treatment injections in adult and pediatric interventional procedures.
Role: Principal Investigator (of Johns Hopkins University sub-contract)

12. Title: Enabling technology for image-guided robot-assisted sub-retinal injections.
Dates: 9/20/2019-6/30/2023
Grantor: National Institutes of Health
Grant #: 1R01 EB025883-01A1 (Iulian Iordachita, PI)
Institution: Johns Hopkins University
Amount: $1,453,260 (Total)
Summary: Develop and test a cooperatively controlled robotic system that in conjunction with force-sensing microsurgical instruments guided by 4D intraoperative Optical Coherence Tomography could enable safe and reliable access to subretinal space.
Role: Principal Investigator

13. Title: An ultra-high (FLASH) dose rate x-ray cabinet system for pre-clinical laboratory radiation research
Dates: 8/01/2021-7/31/2025
Grantor: National Institutes of Health
Grant #: 1R01CA262097-01 (Rezaee, Mohammad, PI)
Institution: JHU
Amount: $2,640,721 (Total)
Summary: The goal of this project is to develop a self-shield kilovoltage x-ray cabinet system with the capabilities of delivering both FLASH and conventional dose-rate irradiations for pre-clinical laboratory research.
Role: Co-Investigator

14. Title: Patient-specific narrow beam breast CT
Dates: 5/01/2021-11/30/2022
Grantor: National Institutes of Health
Grant #: 1R43CA261381 (Ghazi, Peymon, PI)
Institution: Sub-award from Malcova LLC
Amount: $400,000 (Total)
Summary: The goal is to develop dedicated breast CT technology to improve the sensitivity and specificity of breast cancer detection in women with dense breasts.
Role: Co-Investigator

15. Title: MRI Compatible body-mounted robot to streamline pediatric shoulder arthrography.
Dates: 9/15/2016-6/30/2022
Grantor: National Institutes of Health

Grant #: 1R01 EB020003-01 (Kevin Cleary, PI)
Institution: Children's national Medical Center, subcontract Johns Hopkins University
Amount: $593,726 (JHU Total)
Summary: Develop and test a new patient-mounted MRI-compatible shoulder arthrography robot for needle guidance in pediatric interventional procedures.
Role: Principal Investigator (of Johns Hopkins University sub-contract)

16. Title: Enabling Technology for Safe Robot-assisted Surgical Micromanipulation
Dates: 3/15/2017-01/31/2021
Grantor: National Institutes of Health
Grant #: 1R01EB023943-01 (Iulian Iordachita, PI)
Institution: Johns Hopkins University
Amount: $1,017,478/Total
Summary: The goal is to develop a cooperatively controlled robotic system with enhanced sensorimotor capabilities that in conjunction with multifunction force-sensing microsurgical instruments could enable safe robot-assisted retinal surgery.
Role: Principal Investigator

17. Title: Quantitative bioluminescence tomography for pre-clinical radiotherapy research
Dates: 7/01/2019-6/30/2023
Grantor: National Institutes of Health
Grant #: 1R01 CA240811-01 (Ken Wang, PI)
Institution: Johns Hopkins University
Amount: $276,046 (Total)
Summary: Develop and evaluate a tabletop quantitative bioluminescence tomography system readily adopted by small animal commercial irradiators.
Role: Co-Investigator

18. Title: Research and Development on a Novel Robotic System for Microsurgery
Dates: 2/01/2017-3/31/2020
Grantor: Galen Robotics, Inc
Grant #: Galen Robotics (Russell Taylor, PI)
Institution: Johns Hopkins University
Amount: $1,363,808
Summary: This is an industry-sponsored project to develop novel sensor-based tools, image-guidance methods, and applications for a new cooperatively controlled surgical robot for head-and-neck microsurgery.
Role: Co-Investigator

19. Title: An Active Handheld Micromanipulator.
Dates: 8/01/2015-7/31/2019
Grantor: National Institutes of Health
Grant #: 2R01 EB000526-07 (Cameron Riviere, PI)
Institution: Carnegie Mellon University, subcontract Johns Hopkins University
Amount: $354,825
Summary: Develop and test a new handheld micromanipulator that performs active tremor compensation in microsurgery.
Role: Principal Investigator (of Johns Hopkins University sub-contract)

20. Title: Objective assessment of surgical competence in a septoplasty model.
Dates: 7/01/2015-6/30/2020
Grantor: National Institutes of Health
Grant #: R01DE025265 (Masaru Ishii, PI)
Institution: Johns Hopkins University
Amount: $582,025/2016
Summary: Our project aims to provide educators with an integrated objective skills assessment

platform and tools for objective determination of competency, which can be readily deployed across graduate surgical training programs in the country.
Role: Co-Investigator

21. Title: Enabling technology for MRI-guided prostate interventions
Dates: 9/12/2011-7/31/2016
Grantor: National Institutes of Health
Grant #: 2R01CA111288-06 (Clare Tempany, PI)
Institution: Brigham and Women's Hospital, subcontract Johns Hopkins University
Amount: $ 4,090,575
Summary: Develop technology for transrectal needle-based biopsy and local therapy of prostate cancer in conventional closed MRI scanner.
Role: Principal Investigator (of Johns Hopkins University sub-contract)

22. Title: An integrated x-ray/optical tomography system for preclinical radiation research.
Dates: 7/01/2011-6/30/2015
Grantor: National Institutes of Health
Grant #: R01 CA158100-01 (John Wong, PI)
Institution: Johns Hopkins Medical Institutions, subcontract Johns Hopkins University
Amount: $1,682,750
Summary: The goal is to develop an integrated x-ray/bioluminescence tomography system that can function as a standalone imaging research system and also dock to the SARRP to guide focal irradiation.
Role: Principal Investigator (of Johns Hopkins University sub-contract)

23. Title: Integrated 3D X-Ray/ultrasound guided radiation therapy of soft tissue targets
Dates: 10/15/2011-9/31/2015
Grantor: National Institutes of Health
Grant #: 1R01CA161613-01 (John Wong, PI)
Institution: Johns Hopkins Medical Institutions
Amount: $1,559,926
Summary: The goal is to develop an integrated x-ray/ultrasound tomography system on board a medical accelerator to ensure accurate irradiation of abdominal targets that have been difficult to localize with x-ray CT alone.
Role: Co-Investigator

24. Title: An Active Handheld Micromanipulator.
Dates: 2/1/2011 – 1/31/2015
Grantor: National Institutes of Health
Grant #: 1 R01 EB000526-04A1 (Cameron Riviere, PI)
Institution: Carnegie Mellon University, subcontract Johns Hopkins University
Amount: $988,130
Summary: Develop and test a new handheld micromanipulator that performs active tremor compensation in microsurgery.
Role: Principal Investigator (of Johns Hopkins University sub-contract)

25. Title: A Microsurgical Assistant System.
Dates: 8/1/2008 – 6/31/2014
Grantor: National Institutes of Health
Grant #: 1 R01 EB 007969-01 A1 (Russell Taylor, PI)
Institution: Johns Hopkins University
Amount: $5,885,314
Summary: Develop technology and systems addressing fundamental limitations in current microsurgical practice, using vitreoretinal surgery as the initial focus. This includes development of a "surgical workstation" that is interfaced to a stereo visualization subsystem and a family of novel sensors, instruments, and robotic devices.

Role: Co-Investigator

26. Title: OCT Imaging and Assistive Systems for Cochlear Implant Surgery
Dates: 2/01/2012 – 4/31/2014
Grantor: Cochlear Corporation
Grant #: 1 (Russell Taylor, PI)
Institution: Johns Hopkins University
Amount: $ 238,000
Summary: Develop the technology for imaging the cochlea canal and assisting cochlea implant insertion
Role: Co-Investigator

27. Title: Calibration and Commissioning of a Small Animal Radiation Research Platform (SARRP) for Pre-clinical Research
Dates: 09/01/09 – 08/31/12
Grantor: Gulmay Medical Ltd
Grant #: 1 (John Wong, PI)
Institution: Johns Hopkins Medical Institutions
Amount: $100,000
Summary: The goals are to provide continue technical support and to transfer the know-how from Hopkins to Gulmay in their commercialization of the first-generation Small Animal Radiation Research Platform
Role: co-Investigator

28. Title: Engineering Research Center for Computer-Integrated Surgical Systems and Technology.
Dates: 9/1/1997-5/31/2010
Grantor: National Science Foundation
Grant #: EEC 9731748 (Russell Taylor, PI)
Institution: Johns Hopkins University
Amount: $30,000,000 (for 10 years)
Summary: The CISST ERC is a multi-institutional, multidisciplinary center whose focus is of basic science, computer-based technology, and engineered systems working cooperatively with surgeons to significantly change the way surgical procedures are carried out in the 21st century. Significant research focuses include modeling and analysis for treatment planning and control, robotics and human interfaces and systems for minimally invasive, image-guided percutaneous therapy and microsurgery.
Role: Senior Research Staff

29. Title: R01: Transrectal Prostate Therapy Robot in Closed MRI Scanner
Dates: 9/2003 – 7/31/2009
Grantor: National Institutes of Health,
Grant #: 1 R01 EB002963-01 (Louis Whitcomb, PI)
Institution: Johns Hopkins University
Amount: $2,030,342
Summary: The major goal of this project is to design and develop a robot assisted system for transrectal needle placement inside closed MRI magnets for prostate interventions.
Role: Senior Research Staff

30. Title: Enabling technology for MRI-guided prostate interventions
Dates: 6/1/2006 – 5/31/2011
Grantor: National Institutes of Health,
Grant #: R01CA111288-01 (Clare Tempany, PI)
Institution: Brigham and Women's Hospital, Subcontract Johns Hopkins University
Amount: $220,000 (Johns Hopkins University)
Summary: Develop technology for transrectal needle-based biopsy and local therapy of prostate cancer in conventional closed MRI scanner.

Role: Senior Research Staff

31. Title: Image Overlay for MRI-Guided Needle Insertion
Dates: 7/01/2007 – 6/30/2009
Grantor: National Institutes of Health
Grant #: R01 CA118371 (John Carrino, PI)
Institution: Johns Hopkins University
Amount: $300,000
Summary: The goal of this project is to make diagnostic closed high-field MRI scanners available for guiding needle placement with 2D Image Overlay technique.
Role: Senior Research Staff

32. Title: An Image Guided Small Animal Radiation Research Platform
Dates: 4/1/2005 – 3/31/2008
Grantor: National Institutes of Health
Grant #: 1 RO1 CA108449-01 (John Wong, PI)
Institution: Johns Hopkins University
Amount: $253,553 (Y3 total)
Summary: The goal of this project is to develop and test an image guided small animal radiation research platform (SARRP) that will accurately deliver complex ionizing radiation dose distributions in small animal tumor model systems (mice, rats and rabbits).
Role: Senior Research Staff

33. Title: C-arm Fluoroscopy in Prostate Brachyterapy
Dates: 4/1/2005 – 3/31/2008
Grantor: National Institutes of Health
Grant #: 2R44CA099374-02 (Cliff Burdette, PI),
Institution: Johns Hopkins University
Amount: $253,000 (Johns Hopkins University)
Summary: Utilize C-arm fluoroscopy to determine seed locations in prostatic implants and register them to ultrasound space, to provide intra-operative implant optimization
Role: Senior Research Staff

34. Title: Ultrasound Ablation of Bone Cancer with CT Fluoroscopy Guidance
Dates: 9/21/2005 – 9/31/2007
Grantor: National Institutes of Health
Grant #: 1R43CA112852-01 (Burdette)
Institution: Johns Hopkins University
Amount: $22,000 (Johns Hopkins University)
Summary: Develop a system for interstitial ultrasound ablation of metastatic bone cancer
Role: Senior Research Staff

35. Title: Robotic Needle Placement and Injection in Rodents
Dates: 9/10/2003 – 08/31/2005
Grantor: National Institutes of Health
Grant #: R01 CA84596
Institution: Memorial Sloan Kettering Cancer Center
Amount: $167,000 (Johns Hopkins University)
Summary: This is a subcontract from Memorial Sloan Kettering Cancer Center to develop an image-guided robot system for small animal research. Specifically, the robot is used to insert a measurement probe into anatomic targets that are identified in a preoperative PET image.
Role: Senior Research Staff

36. Title: Image Overlay for MRI-Guided Needle Insertions
Dates: 10/01/2002 – 9/30/2006
Grantor: National Institutes of Health

Grant #: R01 CA118371
Institution: Siemens Corporate Research
Amount: $219,000 (Johns Hopkins University)
Summary: The goal of this project is make diagnostic closed high-field MRI scanners available for guiding needle placement with 2D Image Overlay technique
Role: Senior Research Staff

37. Title: Studies on Surgical Robotics
Dates: 10/01/2002 – 09/31/2003
Grantor: Japan Society for the Promotion of Science, a Japanese Government agency
Institution: Graduate School of Frontier Science, the University of Tokyo, JAPAN
Amount: $68,000
Summary: The goal of this project is to develop new robotic devices for medical applications.
Role: co-Investigator

38. Title: Studies on Biologically Inspired Mechanisms for Locomotion
Dates: 06/1993 – 09/1997
Grantor: Ministry of Education/Ministry of Research and Youth, Romania
Grant #: 5006/1993, 468C/1994, 798B/1995, 663/1996, 663/1997
Institution: University of Craiova, Romania
Summary: The goal of this project is to evaluate the possibility of developing new mechanisms for robots' locomotion based on animals' locomotion.
Role: co-Investigator

39. Title: Speed Transducers for Locomotives
Dates: 1988 – 1989
Grantor: SC "Electroputere" SA, Craiova, Romania
Grant #: 2601
Institution: ICSIT-MTAE Craiova, Romania
Role: Project manager

40. Title: Electrical Locomotive for 5000-6000 kW with Thyristors EB-01
Dates: 1988 – 1989
Grantor: SC "Electroputere" SA, Craiova, Romania
Grant #: 2559
Institution: ICSIT-MTAE Craiova, Romania
Role: Research Staff

41. Title: Transformation of Electrical Diesel Locomotive 4000 CP in Electrical Locomotive with Diodes 2900 kW
Dates : 1988 – 1989
Grantor: SC "Electroputere" SA, Craiova, Romania
Grant #: 4119
Institution: ICSIT-MTAE Craiova, Romania
Role: Research Staff

42. Title: Electrical Shunting Diesel Locomotive type 623-BS2
Dates: 1987 – 1988
Grantor: SC "Electroputere" SA, Craiova, Romania
Grant #: 4114
Institution: ICSIT-MTAE Craiova, Romania
Role: Research Staff

43. Title: Electrical Shunting Locomotive LEM-1200 kW
Dates: 1986 – 1989
Grantor: SC "Electroputere" SA, Craiova, Romania

Grant #: 4105
Institution: ICSIT-MTAE Craiova, Romania
Role: Research Staff

44. Title: Electrical Diesel Locomotive 3000 CP ca-ca
Dates: 1985 – 1986
Grantor: SC "Electroputere" SA, Craiova, Romania
Grant #: 4106
Institution: ICSIT-MTAE Craiova, Romania
Role: Research Staff

45. Title: Electrical Locomotive for 3000-4000 kW (Bo-Bo) type Erc 438 CL1
Dates: 1985 – 1986
Grantor: SC "Electroputere" SA, Craiova, Romania
Grant #: 4102
Institution: ICSIT-MTAE Craiova, Romania
Role: Research Staff

46. Title: Electrical Diesel Locomotive, Tropical Climate, DE 626 BL2 and DE 633 BL2
Dates: 1984 – 1986
Grantor: SC "Electroputere" SA, Craiova, Romania
Grant #: 4103
Institution : ICSIT-MTAE Craiova, Romania
Role: Research Staff

ADVISING AND MENTORING

Current Postdoctoral Fellows

1. Kumar Arumugam, Ph.D.

Current Ph.D. Students

1. Jacynthe Francoeur, Ph.D. student, Expected 2029
2. Mojtaba Esfandiari, Ph.D. student, Expected 2026
3. Yanzhou Wang, Ph.D. student, Expected 2025
4. Peiyao Zhang, Ph.D. student, (co-supervised), Expected 2025

Current M.S. and M.S. Thesis Students

1. Chang Chang, M.S.E., Expected 2025, JHU
2. Junling Mei, M.S.E, Expected 2025, JHU
3. Gary Du, M.S.E, Expected 2026, JHU
4. Yiyao Yue, M.S.E, Expected 2026, JHU
5. Tianle Wu, M.S.E, Expected 2026, JHU

Previous Postdoctoral Fellows and Visiting Faculty

1. Yuki Horise, Ph.D., 2014-2015
2. Sohrab-Eslami, Ph.D., 2011-2014
3. Reza Monfaredi, Ph.D., 2012
4. Ki-Young Kim, Ph.D., 2013-2014
5. Sam Song, Ph.D., 2008-2010, co-supervised (Professor Louis Whitcomb, JHU)
6. Samuel Kadoury, Ph.D., Visiting faculty, Polytechnique Montréal, Canada, 2018

7. He Zhang, Ph.D., Visiting faculty, China, 2016-2017
8. Jingzhou Song, Ph.D., Visiting faculty, China, 2015-2016
9. Hao Liu, Ph.D., Visiting faculty, China, 2014-2015
10. Makoto Jinno, Ph.D., Visiting faculty, Kokushikan University, Japan, 2019
11. Niravkumar Patel, Ph.D., 2017-2020
12. Gang Li, Ph.D., 2018-2021
13. Alireza Alamdar, Ph.D., 2019-2022
14. Alejandro Martin-Gomez, Ph.D., co-supervized, 2022
15. David Usevitch, Ph.D. 2023

Previous Ph.D. Students

1. Dimitri Lezcano, Ph.D., JHU, 05. 2024, "ENABLING SHAPE-BASED APPROACHES FOR AUTONOMOUS PERCUTANEOUS INTERVENTIONS WITH SENSORIZED NEEDLES." Program Engineer for Unmanned Ground Vehicles at Persistent Systems, LLC
2. Depeng Liu, visiting PhD student, Shanghai Jiao Tong University, China
3. Ji Woong Kim, Ph.D., JHU, 12.2023, co-supervised with Prof. Marin Kobilarov
4. Shervin Dehghani, visiting PhD student, TUM, Germany, co-supervised with Prof. Nassir Navab
5. Ali Ebrahimi, Ph.D. 08, 2022. "Control and Estimation Methods Towards Safe Robot-assisted Eye Surgery." Currently Robotic Algorithms and Control Engineer, Intuitive Surgical Inc.
6. Alejandro Martin-Gomez, visiting Ph.D. TUM / Research technologist JHU, 2020-2021
7. Jiahao Wu, visiting Ph.D. student, CUHK, China, 12 months.
8. Xiaojun Fan, visiting Ph.D. student, China, 2019
9. Mingchuan Zhou, visiting Ph.D. student, TUM, Germany, 2019
10. Changyan He, visiting Ph.D. student, Beihang University, China, 2017-2019
11. Jiawen Yan, visiting Ph.D. student, China, 2018-2019
12. Frederic Monet, Ph.D. student, Canada, 2019
13. Berk Gonenc, Ph.D., 2017. "Force-sensing-based Multi-platform robotic Assistance for Vitreoretinal Surgery." Currently System analyst, Verb Surgical Inc.
14. Xingchi He, Ph.D., 2015. "Force-sensing Augmented Robotic Assistance for Retinal Microsurgery." Currently System analyst, Intuitive surgical Inc.
15. Shahriar Sefati, Ph.D. student, JHU, 2016-2018, co-supervised (Professor Mehran Armand, JHU).
16. Ryosuke Tsumura, visiting Ph.D. student, Waseda University, Japan, 2017, supervised.
17. Ehsan Azimi, Ph.D. student, JHU, 2016-2017, co-supervised (Professor Peter Kazanzides, JHU)
18. Maria Chatrasingh, visiting Ph.D. student, Mahidol University, Thailand, 2016-2017, supervised.
19. Jiangzhen Guo, visiting Ph.D. student, Beihang University, China, 2015-2016, supervised.
20. Gang Li, visiting Ph.D. student, Worchester Polytechnic Institute, MA, 2015, co-supervised (Professor Gregory Fischer, WPI)
21. Anzhu Goa, visiting Ph.D. student, Shenyang Institute of Automation, China, 2015, co-supervised, (Professor Mehran Armand, JHU).
22. Meng Li, visiting Ph.D. student, Beijing Institute of Technology, China, 2014-2015, supervised.
23. Fereshteh Aalamifar, Ph.D. student, JHU, 2013-2015, co-supervised (Professor Emad Boctor, JHU).
24. Weijian Shang, visiting Ph.D. student, Worchester Polytechnic Institute, MA, 2013-2014, co-supervised, (Professor Gregory Fischer, WPI)
25. Chao (Alex) He, visiting Ph.D. student, Tianjin University, China, 2011-2012, co-supervised (Professor Russell Taylor, JHU);
26. Tutkun Sen, Ph.D. student, JHU, 2012-2016, co-supervised (Professor Peter Kazanzides, JHU)
27. Kevin Olds, Ph.D. student JHU, 2012-2013, co-supervised (Professor Russell Taylor, JHU).
28. Brian Hu, Ph.D. student, JHU, 2011, co-supervised (Professor Russell Taylor, JHU).
29. Reza Seifabadi, visiting Ph.D. student, Queen's University, Canada, 2010-2012, co-supervised (Professor Gabor Fichtinger, Queen's).
30. Greg Cole, visiting Ph.D. student, Worchester Polytechnic Institute, MA, 2010, co-supervised, (Professor Peter Kazanzides, JHU)

31. Paweena U-Thainual, visiting Ph.D. student, Queen's University, Canada, 2009-2012, co-supervised (Professor Gabor Fichtinger, Queen's).

Previous M.S. and Thesis Students

1. Demir Arikan, M.S.E, TUM, supervised 2024
2. Shuyuan Wang, M.S.E., supervised 2024, JHU
3. Yi Wang, M.S.E. supervised 2024, JHU
4. Simon Pannek, M.S.E. TUM, c-supervised, 2023
5. Jacynthe Francoeur, supervised 2023, Polytechnique Montréal, Canada
6. Yangsheng Xu, M.S.E. Alumni, 2023, JHU
7. Jiarong Kang, M.S.E. Alumni, 2023, JHU
8. Botao Zhao, M.S.E., supervised, 2023, JHU.
9. Guanyun Liu, M.S.E., co-supervised, 2023 JHU
10. Yernar Zhetpissov, M.S.E., supervised, 2023, JHU.
11. Alexandra Chen, M.S.E., co-supervised, 2022, JHU
12. Huan Min, M.S.E., co-supervised, JHU
13. Vishnu Kolal, M.S.E., co-supervised, 2022, JHU
14. Guanhao (Dean) Fu, M.S.E., co-supervised, 2022, JHU
15. Kefan Song, M.S.E., supervised, 2022, JHU.
16. Boyang Xiao, M.S.E., supervised, 2022, JHU.
17. Min Jung Kim, M.S.E., supervised, 2022, JHU.
18. Kristina Mach, M.S.E., 2021, TUM, co-supervised
19. Ray Zhang, M.S. student, 2020-2021, JHU, supervised.
20. Yanzhou Wang, M.S. student, 2019-2021, JHU, supervised.
21. Ge Sun, M.S. student, 2020-2021, JHU, supervised.
22. Yangzhe Liu, M.S. student, 2020-2021, JHU, supervised.
23. Wanze Li, M.S. student, 2019-2021, JHU, supervised.
24. Michael Sommersperger, visiting M.S. student, TUM, Germany, 12 months, 2020, co-supervised.
25. Chris Bosch, visiting M.S. student, TUM, Germany, 6 months, 2020, co-supervised.
26. Robert Roth, visiting M.S. student, TUM, Germany, 6 months, 2020, supervised.
27. Emily Yang, M.S. student, 2019-2020, JHU, supervised.
28. Ji Woong Kim, M.S. student, 2019, JHU, co-supervised.
29. Jan Hagemeister, M.S. student, 2019, JHU, supervised.
30. Di Wu, visiting M.S. student, Germany, 2018-2019, Now Ph.D. student at KU Leuven, Belgium
31. Gyeong Hu Kim, M.S. student, 2019, JHU, supervised.
32. Yang Wang, M.S., 2016. JHU, Now Ph.D. student at KTH Stockholm, Sweden
33. Vincent van Geirt, 2014, Thesis was awarded at INSA, Strasbourg, France
34. Ismail Kuru, M.S., 2012. Thesis was awarded at TUM, Munich, Germany
35. Xingchi He, M.S., 2009. Thesis was awarded at TUM, Munich, Germany
36. Ethan Tang, M.S. student, 2017, JHU, supervised.
37. Baichuan Jiang, M.S. student, 2017, JHU, supervised.
38. Saurabh Singh, M.S. student, 2017, JHU, supervised.
39. Ankur Gupta, M.S. student, 2017, JHU, supervised.
40. Ryan Seling, M.S. student, 2017, JHU, supervised.
41. David Levi, M.S. student, 2016-2017, JHU, supervised.
42. Nhat Tran, M.S. student, 2014-2016, JHU, supervised.
43. Rishabh Khurana, M.S. student, 2013, JHU, supervised.
44. Piyawan Moonjaita, visiting M.S. student, Mahidol University, Thailand, 2011, supervised.
45. Yuki Hirose, visiting M.S. student, Osaka University, Japan, 2011, co- supervised (Professor Russell Taylor, JHU).
46. Dominik Gierlach, visiting M.S. student, TUM, Munich, Germany, 2010, supervised.
47. Daniel Roppenecker, visiting M.S. student, TUM, Munich, Germany, 2010, supervised.
48. Ryan Farmer, M.S. student, JHU, 2009, supervised.

49. Zhenglong Sun, visiting M.S. student, Nanyang Technologic al University, Singapore, 2008, supervised.
50. Paweena U-Thainual, visiting M.S. student, Queen's University, Canada, 2008-2009, co-supervised (Professor Russell Taylor, JHU).
51. Kozo Mukaiyama, M.S. student, Tokyo University, Japan, 2002-2003, co-supervised (Professor Ichiro Sakuma, University of Tokyo).

Previous B.S. Students

At the Johns Hopkins University: Jim Wang (2022), Abdullah Armouti (2022), Aabhas Jain (2022, 2023, 2024), Aryan Sabet Payman (2022), Weiqiang Liu (2019), Arushi Singh (2019), Esteban Escobar Gomez (2012), Marisa Babb (2012), Steve Park (2012), Zachary Bredl (2016), Justin Kim (2017), Matthew Heacock (2018), Jan Hagemeister (2018)

Ph.D. Dissertation Committees

At the Johns Hopkins University: Xingchi He (2015), Berk Gonenc (2017), Erin Sutton (2017), Shahriar Sefati (2020), Amirhossein Farvardin (2020), Ali Ebrahimi (2022), Ji Woong Kim (2023), Dimitri Lezcano (2024)

At other institutions: Weijian Shang (Worchester Polytechnic Institute, Worchester. MA, 2015), Gang Li (Worchester Polytechnic Institute, Worchester. MA, 2016), Mingchuan Zhou, (TUM, Germany, 2019), Fayez Alruwaili, (Rowan University, NJ, 2024)

PROFESSIONAL ORGANIZATIONS AND SERVICE

Member

- Romanian Association for Machines and Mechanisms Theory 1992- present
- Romanian Society for Robotics (SRR) 1996 - present
- Institute of Electrical and Electronics Engineers (IEEE, SM14) 2008 - present
- America Society of Mechanical Engineers (ASME) 2010 - present

Editor

Journals

- Journal of Medical Robotics Research: Editor, 2015 - present
- IEEE Robotics and Automation Letters *(RA-L):* Associate Editor, 2015 – 2018
- Sensors, MDPI, Guest Editor for Special Issue "Force and Pressure Based Sensing Medical Application," 2017, 20 papers.
- Sensors, MDPI, Editorial Board Member, 2018 - present

Conference and Workshop Program Committees

- International Symposium on Medical Robotics (ISMR), Co-Chair, 2020, 2021, 2022, 2023, 2024, 2025
- International Symposium on Medical Robotics (ISMR), 2019, 2021 (two workshops), 2022.
- IEEE BioRob 2010
- IEEE IROS 2022 – Full-day Workshop: Advanced Robotics and Visualization for Ophthalmic Surgery. IROS-ARVOS
- IEEE ICRA 2023 – Full-day Workshop: New Evolutions in Surgical Robotics: Embracing Multimodal Imaging Guidance, Intelligence, and Bio-inspired Mechanisms.
- IEEE IROS 2024 – Half-day Workshop: Advanced Robotics and Visualization for Microsurgery. IROS-ARVOS

Reviewer

Grant Proposal Peer Reviews

- National Science Foundation, USA: 2014
- European Research Council, Frontier Research Grants, 2016
- National Institutes of Health, USA: 2019, 2021, 2022

Journals (partial list)

- AAAS, Science Robotics: 2024
- International Journal of Robotics Research: 2011, 2013; 2014; 2015, 2017, 2018
- IEEE Transactions on Robotics: 2011, 2012, 2015; 2019, 2024
- IEEE Transactions on Medical Robotics and Bionics: 2020, 2021, 2022, 2023, 2024
- IEEE Robotics and Automation Letters: 2018, 2019, 2020; 2021, 2022, 2023, 2024
- IEEE Transactions on Mechatronics: 2015; 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024
- Robotica: 2008, 2011; 2015, 2018, 2020, 2021
- International Journal of Computer Assisted Radiology and Surgery: 2009, 2011; 2016, 2017, 2018, 2019, 2020, 2021.
- International Journal of Medical Robotics and Computer Assisted Surgery: 2011, 2012, 2013; 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024
- Transactions on Biomedical Engineering: 2010, 2012; 2016, 2017, 2019, 2020, 2021, 2022, 2023, 2024
- Sensors & Actuators: A. Physical: 2012; 2018, 2022

- Investigative Ophthalmology & Visual Science: 2009, 2010; 2019
- Physics in Medicine and Biology: 2010.

Conferences (partial list)

- IEEE International Conference on Robotics and Automation: 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2019, 2020, 2021, 2022, 2023, 2024
- IEEE International Conference on Intelligent Robots and Systems: 2011; 2014; 2015, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024
- IEEE EMBS International Conference: 2010, 2011, 2012, 2013; 2014; 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024
- IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics: 2010, 2012, 2014,

Service

- WSE Machine Shop Advising Committee 2011 - present.
- ERC/LCSR Safety Committee 2005 - present.

CONTACT INFORMATION

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