

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

- 02.2019 – 05.2019: JHU, WSE, Mechanical Engineering Department:
- **EN.530.404, Engineering Design Project II** (part time)
- 09.2018 – 12.2018: JHU, WSE, Mechanical Engineering Department:
- **EN.530.403, Engineering Design Project I** (part time)
- 02.2018 – 05.2018: JHU, WSE, Mechanical Engineering Department:
- **EN.530.404, Engineering Design Project II** (part time)
- 09.2017 – 12.2017: JHU, WSE, Mechanical Engineering Department:
- **EN.530.403, Engineering Design Project I** (part time)
- 02.2017 – 05.2017: JHU, WSE, Mechanical Engineering Department:
- **EN.530.404, Engineering Design Project II** (part time)
- 09.2016 – 12.2016: JHU, WSE, Mechanical Engineering Department:
- **EN.530.403, Engineering Design Project I** (part time)
- 02.2016 – 05.2016: JHU, WSE, Mechanical Engineering Department:
- **EN.530.404, Engineering Design Project II** (part time)
- 09.2015 – 12.2015: JHU, WSE, Mechanical Engineering Department:
- **EN.530.403, Engineering Design Project I** (part time)
- 02.2015 – 05.2015: 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 Transmissions 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

- 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., Nasser, 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.

Journal Papers

- [J1] Urias, M.G., Patel, N., He, C., Ebrahimi, A., Kim, J.W., **Iordachita, I.** and Gehlbach, P.L., "Artificial intelligence, robotics and eye surgery: are we overfitted?" *International Journal of Retina and Vitreous*, vol.5, no.1, pp.1-4. Dec. 2019. <https://doi.org/10.1186/s40942-019-0202-y>
- [J2] Deng, Z., Xu, X., Garzon-Muvdi, T., Xia, Y., Kim, E., Belcaid, Z., Luksik, A., Maxwell, R., Choi, J., Wang, H., Yu, J., **Iordachita, I.**, Lim, M., Wong, J., and Wang, K., "In vivo Bioluminescence Tomography Center of Mass-Guided Conformal Irradiation." *International Journal of Radiation Oncology* Biology* Physics*. Online 15 Nov. 2019. <https://doi.org/10.1016/j.ijrobp.2019.11.003>
- [J3] Li, G., Patel, N.A., Hagemester, J., Yan, J., Wu, D., Sharma, K., Cleary, K. and **Iordachita, I.**, "Body-mounted robotic assistant for MRI-guided low back pain injection." *International Journal of Computer Assisted Radiology and Surgery*, pp.1-11. Oct. 2019. <https://doi.org/10.1007/s11548-019-02080-3>
- [J4] Alambeigi, F., Pedram, S.A., Speyer, J.L., Rosen, J., **Iordachita, I.**, Taylor, R.H. and Armand, M., 2019. SCADE: Simultaneous Sensor Calibration and Deformation Estimation of FBG-Equipped Unmodeled Continuum Manipulators. *IEEE Transactions on Robotics*. 10.1109/TRO.2019.2946726
- [J5] Huang, P., Su, L., Chen, S., Cao, K., Song, Q., Kazanzides, P., **Iordachita, I.**, Bell, M.A.L., Wong, J.W., Li, D. and Ding, K., "2D ultrasound imaging based intra-fraction respiratory motion tracking for abdominal radiation therapy using machine learning." *Physics in Medicine & Biology*, Online 19 July 2019. <https://iopscience.iop.org/article/10.1088/1361-6560/ab33db/meta>
- [J6] Beisenova, A., Issatayeva, A., **Iordachita, I.**, Blanc, W., Molardi, C. and Tosi, D., "Distributed fiber optics 3D shape sensing by means of high scattering NP-doped fibers simultaneous spatial multiplexing". *Optics Express*, vol. 27, no. 16, pp.22074-22087. Aug. 2019, <https://doi.org/10.1364/OE.27.022074>
- [J7] He, C., N. Patel, M. Shahbazi, Y. Yang, P. L. Gehlbach, M. Kobilarov, and **I. Iordachita**. "Toward Safe Retinal Microsurgery: Development and Evaluation of an RNN-based Active Interventional Control Framework." *IEEE transactions on bio-medical engineering*, On-line 01 July 2019, 10.1109/TBME.2019.2926060
- [J8] He, C., Patel, N., Ebrahimi, A., Kobilarov, M. and **Iordachita, I.**, "Preliminary study of an RNN-based active interventional robotic system (AIRS) in retinal microsurgery." *International journal of computer assisted radiology and surgery*, vol. 14, no. 6, pp. 945-954, Jun 2019. <https://doi.org/10.1007/s11548-019-01947-9>
- [J9] Patel, N., Yan, J., Monfaredi, R., Sharma, K., Cleary, K. and **Iordachita, I.**, "Preclinical evaluation of an integrated robotic system for magnetic resonance imaging guided shoulder arthrography." *Journal of Medical Imaging*, vol. 6, no. 2, p.025006. May 2019, <https://doi.org/10.1117.1.JMI.6.2.025006>
- [J10] Alambeigi, F., Bakhtiarinejad, M., Sefati, S., Hegeman, R., **Iordachita, I.**, Khanuja, H. and Armand, M., "On the Use of a Continuum Manipulator and a Bendable Medical Screw for Minimally-Invasive Interventions in Orthopedic Surgery." *IEEE Transactions on Medical Robotics and Bionics*. Vol. 1, no. 1, pp. 14-21, Feb. 2019, <https://ieeexplore.ieee.org/document/8627979>
- [J11] Moreira, P., Patel, N., Wartenberg, M., Li, G., Tuncali, K., Heffter, T., Burdette, E.C., **Iordachita, I.**, Fischer, G.S., Hata, N. and Tempny, C.M., "Evaluation of robot-assisted

- MRI-guided prostate biopsy: needle path analysis during clinical trials." *Physics in medicine and biology*. vol. 63, no. 20, p.20NT02 (9p), Oct. 2018. <http://iopscience.iop.org/article/10.1088/1361-6560/aae214>
- [J12] Monfaredi, R., **Iordachita, I.**, Wilson, E., Sze, R., Sharma, K., Krieger, A., Fricke, S. and Cleary, K., "Development of a shoulder-mounted robot for MRI-guided needle placement: phantom study." *International Journal of Computer Assisted Radiology and Surgery*, vol. 13, no.11, pp.1829-1841. Nov. 2018. <https://doi.org/10.1007/s11548-018-1839-y>
- [J13] Wartenberg, M., Schornak, J., Gandomi, K., Carvalho, P., Nycz, C., Patel, N., **Iordachita, I.**, Tempany, C., Hata, N., Tokuda, J. and Fischer, G.S., "Closed-Loop Active Compensation for Needle Deflection and Target Shift During Cooperatively Controlled Robotic Needle Insertion." *Annals of biomedical engineering*, pp.1-13. Jun. 2018 <https://doi.org/10.1007/s10439-018-2070-2>
- [J14] Patel, N.A., Li, G., Shang, W., Wartenberg, M., Heffter, T., Burdette, E.C., **Iordachita, I.**, Tokuda, J., Hata, N., Tempany, C.M. and Fischer, G.S., "System Integration and Preliminary Clinical Evaluation of a Robotic System for MRI-Guided Transperineal Prostate Biopsy," *Journal of Medical Robotics Research*. vol. 4, no. 02, pp. 1950001, Jun. 2019, <https://doi.org/10.1142/S2424905X19500016>
- [J15] Tsumura, R., Kim, J.S., Iwata, H., **Iordachita, I.I.**, "Preoperative Needle Insertion Path Planning for Minimizing Deflection in Multi-layered Tissues." *IEEE Robotics and Automation Letters*. vol. 3, no. 3, pp.2129-2136, Jul. 2018, <https://doi.org/10.1109/LRA.2018.2809540>
- [J16] Gonenc, B., Chae, J., Gehlbach, P., Taylor, R.H., and **Iordachita, I.**, "Towards Robot-Assisted Retinal Vein Cannulation: A Motorized Force-Sensing Microneedle Integrated with a Handheld Micromanipulator." *Sensors*. vol. 17, no.10. p. 2195 (25 pg.) Sep. 2017. <https://doi.org/10.3390/s17102195>
- [J17] Su, L., **Iordachita, I.**, Zhang, Y., Lee, J., Ng, S.K., Jackson, J., Hooker, T., Wong, J., Herman, J.M., Sen, H.T. and Kazanzides, P., "Feasibility study of ultrasound imaging for stereotactic body radiation therapy with active breathing coordinator in pancreatic cancer." *Journal of Applied Clinical Medical Physics*. vol. 18, no. 4, pp.84-96, Jul. 2017. <https://doi.org/10.1002/acm2.12100>
- [J18] Alambeigi, F., Wang, Y., Sefati, S., Gao, C., Murphy, R.J., **Iordachita, I.**, Taylor, R.H., Khanuja, H. and Armand, M., "A curved-drilling approach in core decompression of the femoral head osteonecrosis using a continuum manipulator." *IEEE Robotics and Automation Letters*, vol. 2, no. 3, pp.1480-1487, Jul. 2017, <https://doi.org/10.1109/LRA.2017.2668469>
- [J19] Sen, H., Bell, M.L., Zhang, Y., Ding, K., Boctor, E., Wong, J., **Iordachita, I.** and Kazanzides, P., "System Integration and In-Vivo Testing of a Robot for Ultrasound Guidance and Monitoring during Radiotherapy." *IEEE Transactions on Biomedical Engineering*. vol. 64, no. 7, pp. 1608-1618, Jul. 2017, <https://doi.org/10.1109/TBME.2016.2612229> .
- [J20] Channa, R., **Iordachita, I.**, Handa, J.T., "Robotic Vitreoretinal Surgery." *RETINA*. . vol. 37, no. 7, pp.1220-1228, Jul. 2017, <https://doi.org/10.1097/IAE.0000000000001398>
- [J21] Gonenc, B., Chamani, A., Handa, J., Gehlbach, P., Taylor, R.H. and **Iordachita, I.**, "3-DOF Force-Sensing Motorized Micro-Forceps for Robot-Assisted Vitreoretinal Surgery." *IEEE Sensors Journal*. vol. 17, no. 11, pp. 3526-3541, Jun. 2017, <https://doi.org/10.1109/JSEN.2017.2694965>
- [J22] Li, M., Li, G., Gonenc, B., Duan, X. and **Iordachita, I.**, "Towards human-controlled, real-time shape sensing based flexible needle steering for MRI-guided percutaneous therapies." *The International Journal of Medical Robotics and Computer Assisted Surgery*. vol. 13, no. 2, e1762, (14 pg.), Jun. 2017, <https://doi.org/10.1002/rcs.1762>

- [J23] Marker, D.R., U-Thainual, P., Flammang, A.J., Fichtinger, G., **Iordachita, I.I.**, Carrino, J.A. and Fritz, J., "1.5 T augmented reality navigated interventional MRI: paravertebral sympathetic plexus injections." *Diagnostic and Interventional Radiology*, vol. 23, no. 3, pp.227-232, May 2017, <https://doi.org/10.5152/dir.2017.16323>, PMC5411005
- [J24] Su, H., **Iordachita, I.**, Tokuda, J., Hata, N., Liu, X., Seifabadi, R., Xu, S., Wood, B., Fischer, G., "Fiber Optic Force Sensors for MRI-Guided Interventions and Rehabilitation: A Review." *IEEE Sensors Journal*. vol. 17, no. 7, pp.1952-1963, Apr. 2017, <https://doi.org/10.1109/JSEN.2017.2654489>
- [J25] Aalamifar, F., Khurana, R., Cheng, A., Guo, X., **Iordachita, I.** and Boctor, E.M., "Enabling technologies for robot assisted ultrasound tomography." *The International Journal of Medical Robotics and Computer Assisted Surgery*. vol. 13, no. 1, pp.1-11, Mar. 2017. <https://doi.org/10.1002/rcs.1746>
- [J26] Gao, A., Murphy, R., Liu, H., **Iordachita, I.** and Armand, M., "Mechanical Model of Dexterous Continuum Manipulators with Compliant Joints and Tendon/External Force Interactions." *IEEE/ASME Transactions on Mechatronics*. vol. 22, no. 1, pp.465-475, Feb. 2017, <https://doi.org/10.1109/TMECH.2016.2612833>
- [J27] Sen, H.T., Cheng, A., Ding, K., Boctor, E., Wong, J., **Iordachita, I.** and Kazanzides, P., "Cooperative Control with Ultrasound Guidance for Radiation Therapy," *Frontiers in Robotics and AI*, vol. 3, p.49, Sep. 2016, <https://doi.org/10.3389/frobt.2016.00049>
- [J28] Seifabadi, R., Aalamifar, F., **Iordachita, I.**, Fichtinger, G., "Toward Teleoperated Needle Steering under Continuous MRI Guidance for Prostate Percutaneous Interventions." *Int. J. Med. Robotics and Comput. Assist. Surg*, vol. 12, no. 3, pp. 355-369, Sep. 2016. <https://doi.org/10.1002/rcs.1692>
- [J29] Bell, M., Kumar, S., Kuo, L., Tutkun Sen, H., **Iordachita, I.**, & Kazanzides, P., "Toward standardized acoustic radiation force-based ultrasound elasticity measurements with robotic force control." *IEEE Transactions on Biomedical Engineering*, vol. 63, no. 7, pp. 1517-1524, Jul. 2016, <https://doi.org/10.1109/TBME.2015.2497245>
- [J30] Eslami, S., Shang, W., Li, G., Patel, N., Fischer, G.S., Tokuda, J., Hata, N., Tempany, C.M., **Iordachita, I.**, "In-Bore Prostate Transperineal Interventions with an MRI-guided Parallel Manipulator: System Development and Preliminary Evaluation." *Int. J. Med. Robotics and Comput. Assist. Surg*, vol. 12, no. 2, pp. 199-213, Jun. 2016. <https://doi.org/10.1002/rcs.1671>
- [J31] Yu, J., Zhang, B., **Iordachita, I.I.**, Reyes, J., Lu, Z., Brock, M.V., Patterson, M.S., Wong, J.W. and Wang, K.K.H., "Systematic study of target localization for bioluminescence tomography guided radiation therapy." *Medical physics*, vol. 43, no. 5, pp.2619-2629, May 2016, <https://doi.org/10.1118/1.4947481>
- [J32] Marker, D.R., U-Thainual, P., Ungi, T., Flammang, A., Fichtinger, G., **Iordachita, I.**, Carrino, J.A., Fritz, J., "MR-guided Perineural Injection of the Ganglion Impar: Technical Considerations and Feasibility." *Skeletal Radiology*, vol. 45, no. 5, pp. 591-597, May, 2016, <https://doi.org/10.1007/s00256-016-2333-7>
- [J33] Zhang, B., Wang, K.K-H., Yu, J., Eslami, S., **Iordachita, I.**, Reyes, J., Malek, R., Tran, P.T., Patterson, M.S., Wong, J.W., "Bioluminescence tomography guided radiation therapy for preclinical research," *International Journal of Radiation Oncology* Biology* Physics*, vol. 94, no. 5, pp. 1144-1153, Apr. 2016, <https://doi.org/10.1016/j.ijrobp.2015.11.039>
- [J34] Liu, H., Farvardin, A., Grupp, R., Murphy, R., Taylor, R.H., **Iordachita, I.**, Armand, M., "Shape tracking of a dexterous continuum manipulator utilizing two large deflection shape sensors," *IEEE Sensor Journal*, vol. 15, no. 10, pp. 5494-5503, Oct. 2015, <https://doi.org/10.1109/JSEN.2015.2442266>

- [J35] Yang, Y., Armour, M., Wang, K., Gandhi, N., **Iordachita, I.**, Siewerdsen, J., Wong, J., "Evaluation of a cone beam computed tomography geometry for image guided small animal irradiation," *Physics in Medicine and Biology*, vol. 60, no. 13, pp. 5163-5177, Jun. 2015, <https://doi.org/10.1088/0031-9155/60/13/5163>
- [J36] Yang, Y., Wang, K.K-H., Eslami, S., **Iordachita, I.**, Naser, M., Patterson, M.S., and Wong, J.W., "Systematic calibration of an integrated x-ray and optical tomography system for preclinical radiation research" *Med. Phys.*, vol. 42, no. 4, pp. 1710-1720, Apr. 2015, <https://doi.org/10.1118/1.4914860>
- [J37] Fritz, J., U-Thainual, P., Ungi, T., Flammang, A.J., Kathuria, S., Fichtinger, G., **Iordachita, I.**, Carrino, J.A., "MR-Guided Vertebroplasty with Augmented Reality Image Navigation," *Cardiovasc. Intervent. Radiol.* vol. 37, no. 5, pp. 1589-1596, Dec. 2014, <https://doi.org/10.1007/s00270-014-0885-2>
- [J38] Lediju Bell, M.A., Sen, H.T., **Iordachita, I.**, Kazanzides, P., Wong, J., "In vivo reproducibility of robotic probe placement for an novel ultrasound-guided radiation therapy system," *Journal of Medical Imaging*, vol. 1, no. 2, p. 025001, Jul.– Sep. 2014, <https://doi.org/10.1117/1.JMI.1.2.025001>
- [J39] Gurbani, S., Wilkening, P., Zhao, M., Gonenc, B., Cheon, G.W., **Iordachita, I.**, Chien, W.W., Taylor, R.H., Niparko, J., Kang, J.U., "Robot-assisted three-dimensional registration for cochlear implant surgery using a common path swept-source optical coherence tomography probe," *Journal of Biomedical Optics*, vol. 19, no. 5, p. 057004, May 2014, <https://doi.org/10.1117/1.JBO.19.5.057004>
- [J40] He, X., Handa, J., Gehlbach, P., Taylor, R., **Iordachita, I.**, "A Sub-Millimetric 3DOF Force Sensing Instrument with Integrated Fiber Bragg Grating for Retinal Microsurgery," *IEEE Transaction on Biomedical Engineering*, vol. 61, no. 2, pp. 522-534, Feb. 2014, <https://doi.org/10.1109/TBME.2013.2283501>
- [J41] Seifabadi, R., Cho, N.B., Song, S.E., Tokuda, J., Hata, N., Tempany, C.M., Fichtinger, G., **Iordachita, I.**, "Accuracy Study of a Robotic System for MRI-guided Prostate Needle Placement," *Int. J. Med. Robot.*, vol. 9, no. 3, pp. 305-316, Sep. 2013. <https://doi.org/10.1002/rcs.1440>
- [J42] Fritz, J., U-Thainual, P., Ungi, T., Flammang, A.J., McCarthy, E., Fichtinger, G., **Iordachita, I.**, Carrino, J.A., "Augmented Reality Visualization using Image Overlay Technology for MR-Guided Interventions: Cadaveric Bone Biopsy at 1.5 Tesla," *Invest. Radiol.*, vol. 48, no. 6, pp. 464-470, Jun. 2013, <https://doi.org/10.2214/AJR.10.5038>
- [J43] Song, S.E., Hata, N., **Iordachita, I.**, Fichtinger, G., Tempany, C.M., Tokuda, J. A., "Workspace-oriented Needle Guiding Robot for 3T MRI-guided Transperineal Prostate Intervention: Evaluation of In-bore Workspace and MRI Compatibility," *Int. J. Med. Robot.*, vol. 9, no. 1, pp. 67-74, Mar. 2013, <https://doi.org/10.1002/rcs.1430>
- [J44] Tuli, R., Armour, M., Surmak, A., Reyes, J., **Iordachita, I.**, Patterson, M., Wong, J., "Accuracy of Off-Line Bioluminescence Imaging to Localize Targets in Preclinical Radiation Research," *Radiation Research*, vol. 179, no. 4, pp. 416-421, Apr. 2013, <https://doi.org/10.1667/RR2999.2>
- [J45] Cutler, N., Balicki, M., Finkelstein, M., Wang, J., Gehlbach, P., McGready, J., **Iordachita, I.**, Taylor, R., Handa, J. T., "Auditory Force Feedback Substitution Improves Surgical Precision during Simulated Ophthalmic Surgery," *Invest. Ophthalmol. Vis. Sci.*, vol. 54, no. 2, pp. 1316-1324, Feb. 2013, <https://doi.org/10.1167/iovs.12-11136>
- [J46] Krieger, A., Song, S.E., Cho, N.B., **Iordachita, I.I.**, Guion, P., Fichtinger, G., Whitcomb, L.L., "Development and Evaluation of an Actuated MRI-Compatible Robotic System for MRI-Guided Prostate Intervention," *IEEE ASME Trans. Mechatron.*, vol. 18, no. 1, pp. 273-284, Feb. 2013, <https://doi.org/10.1109/TMECH.2011.2163523>
- [J47] U-Thainual, P., Fritz, J., Moonjaita, C., Ungi, T., Flammang, A.J., Carrino, J.A., Fichtinger,

- G., **Iordachita, I.I.**, "MR Image Overlay Guidance: System Evaluation for Pre-clinical use," *Int. J. Comput. Assist. Radiol. Surg.*, vol. 33, no. 1, pp. 200-206, Jan. 2013, <https://doi.org/10.1007/s11548-012-0788-0>
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- Society, in conjunction with the 2008 World Congress of Brachytherapy*, Boston. (Abstract in *Brachytherapy*, Issue 7, page 102, 2008), May 2008.
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- [A61] **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., **lordachita, 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] **lordachita, 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., **lordachita, 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] **lordachita 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)
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 - [O15] **lordachita, 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] **lordachita, 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] **lordachita, 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., **lordachita, I.**, "Software Package for the Masses Calculus of Tubes Presenting Ribs," *National Symposium PRASIC'94*, Brasov, Romania, pp. ,61-68, 1994 (in Romanian)
 - [O19] **lordachita, 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] **lordachita, 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., **lordachita, 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., **lordachita, 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] **lordachita, 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 Transperineal Prostate 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 Instruments for Robot-Assisted Surgery,” invited talk to *Workshop on Current and Future Challenges 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, September 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

Invited University Colloquia and Seminars

- [T13] “Robot-assisted retinal microsurgery: current challenges and future perspectives,” Worcester Polytechnic Institute, Worcester, MA, USA, December 5th 2014.
- [T14] “Optical Fiber-based Sensorized Instruments for Robot-Assisted Surgery,” SPL, Brigham and Women’s Hospital, Boston, MA, USA, March 23rd, 2016
- [T15] “Safe Robot-Assisted Retinal Surgery,” LCSR Seminar, JHU, Baltimore, MD. USA, April 17th, 2019

RESEARCH FUNDING AND SUPPORT

Current:

1. Title: MRI Compatible Robot for Improved Pain Injections in Adults and Children.

- Dates: 6/01/2018-2/28/2022
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)
2. 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
3. Title: MRI Compatible body-mounted robot to streamline pediatric shoulder arthrography.
Dates: 9/15/2016-6/30/2020
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)
4. Title: Enabling technology for image-guided robot-assisted sub-retinal injections.
Dates: 9/20/2019-6/30/2022
Grantor: National Institutes of Health
Grant #: 1R01 EB025883-01A1 (Iulian Iordachita, PI)
Institution: Johns Hopkins University
Amount: \$480,791 (Y1)
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 the subretinal space.
Role: Principal Investigator
5. 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
6. Title: Automating mosquito microdissection for a malaria PfSPZ vaccine
Dates: 9/01/2017-4/31/2020

Grantor: NIH SBIR (Subcontract from Sanaria)
Grant #: R44 AI134500-01(Russell Taylor, PI)
Institution: Johns Hopkins University
Amount: \$ 898,928
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

7. Title: Adaptive Percutaneous Prostate Interventions using Sensorized Needle.
Dates: 8/01/2019-7/31/2022
Grantor: National Institutes of Health
Grant #: 1R01 CA235134-01(Junichi Tokuda, PI)
Institution: BWH, subcontract Johns Hopkins University
Amount: \$171,160 (JHU/Y1)
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)
8. Title: X-ray/optical tomographic guidance and assessment for pre-clinical radiation research
Dates: 6/01/2019-3/31/2024
Grantor: National Institutes of Health
Grant #: 1R01 CA230341-01 (Ken Wang, PI)
Institution: Johns Hopkins University
Amount: \$314,480 (JHU/Y1)
Summary: Advance the in vivo cancer imaging capability of SARRP to include quantitative bioluminescence and fluorescence tomography.
Role: Co-Investigator
9. 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 (JHU/Y1)
Summary: Develop and evaluate a tabletop quantitative bioluminescence tomography system readily adopted by small animal commercial irradiators.
Role: Co-Investigator

Completed:

10. 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)
11. 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
12. 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)
13. 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)
14. 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
15. 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)
16. 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
17. 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
18. 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
19. 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
20. 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
21. 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
22. 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
23. 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 (3 year 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
24. Title: C-arm Fluoroscopy in Prostate Brachytherapy
 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
25. 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
- 26 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
27. 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
28. 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
29. 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
30. Title: Speed Transducers for Locomotives
 Dates: 1988 – 1989
 Grantor: SC "Electroputere" SA, Craiova, Romania
 Grant #: 2601
 Institution: ICSIT-MTAE Craiova, Romania
 Role: Project manager
31. 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
32. 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
33. 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
34. 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
35. 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
36. 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
37. 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

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), 2018, 2019, 2020.
- IEEE BioRob 2010

Reviewer

Grant Proposal Peer Reviews

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

Journals (partial list)

- International Journal of Robotics Research: 2011, 2013; 2014; 2015, 2017, 2018
- IEEE Transactions on Robotics: 2011, 2012, 2015; 2019
- IEEE Transactions on Mechatronics: 2015; 2016, 2017, 2018, 2019
- Robotica: 2008, 2011; 2015, 2018
- International Journal of Computer Assisted Radiology and Surgery: 2009, 2011; 2016, 2017, 2018, 2019
- International Journal of Medical Robotics and Computer Assisted Surgery: 2011, 2012, 2013; 2015, 2016, 2017, 2018, 2019
- Transactions on Biomedical Engineering: 2010, 2012; 2016, 2017, 2019
- Sensors & Actuators: A. Physical: 2012; 2018
- Investigative Ophthalmology & Visual Science: 2009, 2010;
- Physics in Medicine and Biology: 2010;

Conferences (partial list)

- IEEE International Conference on Robotics and Automation: 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2019
- IEEE International Conference on Intelligent Robots and Systems: 2011; 2014; 2015, 2017, 2018, 2019
- IEEE EMBS International Conference: 2010, 2011, 2012, 2013; 2014; 2015, 2016, 2017, 2018, 2019
- 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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