PERSONAL INFORMATION

Iosif Birlescu

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Sex Male | Date of birth 22/11/1986 | Nationality Romanian

WORK EXPERIENCE

Oct. 2020-present

Associate teacher

Faculty of Machine Building, Department of Mechanical Systems Engineering, at Technical University from Cluj-Napoca

Oct. 2015-present

Junior researcher

CESTER research centre at Technical University from Cluj-Napoca

- Research and development
- Modelling and simulating medical robotic structures
- Scientific programming
- Mathematical modelling for medical robotics
- Financed by the projects:
  - PN-II-PT-PCCA-2013-4-0647-ROBOCORE, with contributions in the development of a prostate biopsy robotic system;
  - E P59/2015 ACCURATE, with contributions in the development of automated robotic instruments for cancer diagnosis and treatment;
  - D P_37_215 Cod MySMIS 2014: 103415 AGEWELL, with contributions in the development of rehabilitation robotic systems
  - PN-III-P1-1.2-PCCDI2017-0221 IMPROVE, with contributions in the development of a robotic system for liver cancer targeted treatment
  - EIT-Health INNOHEALTH, with contributions in the optimization of rehabilitation robotic systems
  - PN-III-P2-2.1-PED2019-3022 NEUROASSIST, ongoing research for optimizing robotic systems for rehabilitation
  - PN-III-P2-2.1-PED2019-4375 ONTARGET, ongoing research for optimizing robotic instruments for cancer treatment

Dec. 2014 – May 2015

Professional internship for the Master's thesis

Medical University of Vienna, Department of Medical Radiation Physics and Oncology

- Developing a computational model to project retinal images onto a 3D virtual model of the eye.
- Scientific programing

Feb. 2011 – May 2011

Practical training for students (Optometry)

S.C. Optimed, Brasov Romania.

- Optometric training such as: lens measuring, eye refraction measurements.

EDUCATION AND TRAINING

Oct. 2020 – present

Postdoctoral researcher

Technical University from Cluj-Napoca, Romania

- Medical robotics modelling and simulation
- Mechanism theory (kinematics, singularities, workspace, dynamics)
- Mechanical systems testing

Oct. 2015 – December 2019

PhD position (awarded in 30.12.2019) in mechanical engineering

Technical University from Cluj-Napoca, Romania

- Medical robotics modelling and simulation
- Mechanism theory (kinematics, singularities, workspace, dynamics)
- Mechanical systems testing

Sept. 2013 – Jun. 2015

Biomedical Engineering Sciences (MSc)

University of Applied Sciences, Technikum Wien, Austria

- Developing skills in optics for medicine, image analysis, data processing
- Engineering (hardware and software design)
- Worked on an optics related project, involving a mechanical eye model.
- **Thesis**: "Projection of ophthalmic fundus images onto a three dimensional model of the eye"

Oct. 2008 – Jun. 2012

Optometry (BSc)

Transilvania University, Brasov Romania.

- Knowledge about optics, eye anatomy and eye physiology
- Basics of engineering for optical design
- **Thesis**: "Methods used in correction of amblyopia on preschool children"

Sept. 2001 – Jun. 2005

Electronics (High School)

Basic of electronics used in telecommunications

PERSONAL SKILLS

Mother tongue(s): Romanian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	B2	B2	B2	B2

Communication skills

Good communication skill (written and verbal) gained during the years of study due to the volume of project presentations, conference presentations and seminars, and written scientific publications.
Good communication regarding mathematics and physics skills due to student tutoring.

Digital competence

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
Independent user	Independent user	Independent user	Independent user	Independent user

Programming languages:

- Matlab, Python, Labview, C

CAD software

- Siemens NX
- Mathematical modelling software
- Maple

Publications

- Tucan, P.; Vaida, C.; Ulinici, I.; Banica, A.; Burz, A.; Pop, N.; **Birlescu, I.**; Gherman, B.; Plitea, N.; Antal, T.; Carbone, G.; Pisla, D, Optimization of the ASPIRE Spherical Parallel Rehabilitation Robot Based on Its Clinical Evaluation, Int. J. Environ. Res. Public Health, 18(6), 3281, 2021
- I. Nadas, B. Gherman, **I. Bîrlescu**, R. Bogateanu, A. Banica, G. Carbone, D. Pisla: Dynamic balancing of RECOVER robotic system, IOP Conf. Ser.: Mater. Sci. Eng. 997 012083, 2020
- Z. Major, C. Vaida, K. Major, P. Tucan, G. Simori, A. Banica, E. Brusturean, A. Burz, R. Craciunas, I. Ulinici, G. Carbone, B. Gherman, **I. Birlescu**, D. Pisla: The Impact of Robotic Rehabilitation on the Motor System in Neurological Diseases. A Multimodal Neurophysiological Approach, Int. Jour. Of Environmental Research and Public Health, 17(18), 6557, 2020.
- N. Pop, I. Ulinici, P. Tucan, **I. Bîrlescu**, C. Vaida, G. Carbone, D. Pîslă: EXPERIMENTAL EVALUATION OF A PARALLEL REHABILITATION ROBOT FOR NEUROMOTOR IMPAIRMENT, Acta Technica Napocensis, 64(1), 2021.
- D. Pisla, I. Birlescu, E. Mois, P. Tucan, C. Radu, A. Burz, B. Gherman, T. Antal, C. Vaida, N. AL Hajjar: SIMULATION AND CONTROL OF AN INNOVATIVE MEDICAL PARALLEL ROBOT USED FOR HCC TREATMENT PROCEDURE, Acta Technica Napocensis, 64(1), 2021.
- Radu, C.; Fisher, P.; Mitrea, D.; Birlescu, I.; Marita, T.; Vancea, F.; Florian, V.; Tefas, C.; Badea, R.; Ștefănescu, H.; Nedevschi, S.; Pisla, D.; Hajjar, N.A: Integration of Real-Time Image Fusion in the Robotic-Assisted Treatment of Hepatocellular Carcinoma, Biology, 9(11), 397, 2020
- **I. Birlescu**, M. Husty, C. Vaida, B. Gherman, P. Tucan, D. Pisla: Joint-Space Characterization of a Medical Parallel Robot Based on a Dual Quaternion Representation of SE(3), Mathematics, vol.8, 1086, ISSN 2227-7390, 2020.
- C. Vaida, **I. Birlescu**, A. Pisla, I. Ulinici, D. Tarnita, G. Carbone, D. Pisla: Systematic design of a parallel robot for lower limb rehabilitaiton, IEEE Access, vol.8, pp. 34522 - 34537, ISSN 2169-3536, 2020
- C. Vaida, **I. Birlescu**, A. Pisla, I. Ulinici, D. Tarnita, G. Carbone, D. Pisla: Motion Parameterization of Parallel Robots Used in Lower Limb Rehabilitation, Advances in Robot Kinematics - ARK 2020, pp. 57-64, 2020.
- B. Gherman, **I. Birlescu**, A. Burz, I. Ulinici, P. Tucan, D. Pisla: Kinematic analysis of two innovative medical instruments for the robotic assisted treatment of non-resectable liver tumors, European Conference on Mechanism Science, 189-197, 2020
- D. Pisla, C. Vaida, N. Pop, I. Ulinici, A. Banica, **I. Birlescu**, et al: Dimensional and Workspace Analysis of RAISE Rehabilitation Robot, European Conference on Mechanism Science, 155-165, 2020
- **I. Birlescu**, M. Husty, C. Vaida, N. Plitea, A. Nayak, D. Pisla: Complete Geometric Analysis Using the Study SE(3) Parameters for a Novel, Minimally Invasive Robot Used in Liver Cancer Treatment, Symmetry, vol.11, 1491, ISSN 2073-8994, 2019.
- D. Pisla, C. Vaida, **I. Birlescu**, B. Gherman, N. Plitea: Risk management for the reliability of robotic assisted treatment of non-resectable liver tumors, Applied sciences, vol. 10(1), 52, ISSN 2076-3417, 2019.
- B. Gherman, **I. Birlescu**, N. Plitea, G. Carbonne, D. Tarnita, D. Pisla: On the singularity-free workspace of a parallel robot for lower-limb rehabilitation, Proceedings of the Romanian Academy, series A, Mathematics, Physics, technical Sciences, Information Science, vol 20(4), pp. 383-391, 2019.
- M. Husty, **I. Birlescu**, P. Tucan, C. Vaida, D. Pisla: An algebraic parameterization approach for parallel robots analysis, Mechanism and Machine Theory, 140, pp. 245257, 2019.
- **I. Birlescu**, C. Vaida, A. Pisla, G. Carbone, D. Pisla: Singularity Analysis of a Spherical Robot Used in Upper Limb Rehabilitation, Interdisciplinary Applications of Kinematics, Mechanisms and Machine Science, 71, pp. 205-213, 2019.
- **I. Birlescu**, D. Pisla, B. Gherman, A. Pisla, C. Vaida, G. Carbone, N. Plitea: On the Singularities of a Parallel Robotic System Used for Elbow and Wrist Rehabilitation, International Symposium on Advances in Robot Kinematics, Springer Proceedings in Advanced Robotics, 8, pp. 203-211, 2019.
- C. Vaida, **I. Birlescu**, A. Pisla, G. Carbone, N. Plitea, I. Ulinici, B. Gherman, F. Puskas, P. Tucan: RAISE-An Innovative Parallel Robotic System for Lower Limb Rehabilitation, New Trends in Medical and Service, Robotics, Springer, 2019.
- B. GHERMAN, N. AL HAJJAR, B. Alin, **I. BIRLESCU**, et al: DESIGN OF AN INNOVATIVE MEDICAL ROBOTIC INSTRUMENT FOR MINIMALLY INVASIVE TREATMENT OF LIVER TUMORS, ACTA TECHNICA NAPOCENSIS-Series: APPLIED MATHEMATICS, MECHANICS, and ENGINEERING, 2020.
- B. Gherman, **I. Birlescu**, F. Puskas, A. Pisla, G. Carbone, P. Tucan, A. Banica, D. Pisla: A kinematic characterization of a parallel robotic system for lower limb rehabilitation, EuCoMeS 2018, Mechanisms and Machine Science, 59, pp. 27-34, 2019.
- C. Vaida, N. Plitea, G. Carbone, **I. Birlescu**, I. Ulinici, A. Pisla, D. Pisla: Innovative development of a spherical parallel robot for upper limb rehabilitation. International Journal of Mechanisms and Robotic Systems 4 (4), 256-276, 2018.
- D. Pisla, **I. Birlescu**, C. Vaida, P. Tucan, A. Pisla, B. Gherman, N. Crisan, N. Plitea: Algebraic modeling of kinematics and singularities for a prostate biopsy parallel robot, Proceedings of the Romanian Academy Series A-Mathematics Physics Technical Sciences Information Science, 19(3), pp. 489-497, 2018.
- C. Vaida, **I. Birlescu**, N. Plitea, N. Crisan, D. Pisla: Design of a needle insertion module for robotic assisted transperineal prostate biopsy, Mechanisms and Machine Science, 48, pp. 1-15, 2018.
- **I. Birlescu**, P. Tucan, B. Gherman, C. Vaida, N. Crisan, C. Radu, N. Plitea, D. Pisla: Kinematic Analysis For A

Prostate Biopsy Parallel Robot Using Study Parameters, Mechanisms And Machine Science, 50, pp. 135-142, 2018.

- B. Gherman, **I. Birlescu**, P. Tucan, C. Vaida, A. Pisla, D. Pisla: Modelling and Simulation of a Robotic System for Lower Limb Rehabilitation, Proceedings of the ASME Design Engineering Technical Conference, 5B, 2018.
- **I. Birlescu**, F. Craciun, C. Vaida, B. Gherman, D. Pisla: An innovative automated instrument for robotically assisted brachytherapy used in cancer treatment, ACTA TECHNICA NAPOCENSIS-Series: APPLIED MATHEMATICS, MECHANICS and ENGINEERING, 60, pp. 633-638, 2017.
- D. Pisla, **I. Birlescu**, C. Vaida, P. Tucan, B. Gherman, D. Popescu, N. Plitea: Towards a fail-safe prostate biopsy parallel robot using algebraic geometry, DEStech Transactions on Engineering and Technology Research, pp: 422-427, 2017.
- P. Tucan, C. Vaida, B. Gherman, F. Craciun, N. Plitea, **Birlescu, I.**, D. Pisla: Control system of a medical parallel robot for transperineal prostate biopsy, International Conference on System Theory, Control and Computing, 2017.
- **I. Birlescu**, C. Vaida, F. Graur, C. Radu, D. Pisla: Medical instrument for robotic assisted radiofrequency liver ablation, Bulletin of the Transilvania University of Brasov, 10(2), pp. 1-6, 2017.
- G. Heilemann, L. Fetty, **I. Birlescu**, et al: OC-0152: Novel software modules for treatment planning of 106Ru eye plaque brachytherapy, Radiotherapy and Oncology 119, S69-S70, 2016
  G. Heilemann, L. Fetty, M. Blaickner, N. Nesvacil, **I. Birlescu**, et al: Evaluation of Dose Response in 106Ru Eye Plaque Brachytherapy Using a Novel Software Tool, Brachytherapy 15, S160, 2016

Conference attendances

- 7th IFToMM International Worksop on Computational Kinematics, CK 2017, Poitieres, France, May 22-24, 2017 – with the paper " Kinematic Analysis for a Prostate Biopsy Parallel Robot Using Study Parameters"
- 3rd International Conference for Doctoral Students - IPC 2017 June 22-23, 2017 Braşov, Romania. With the paper "Medical instrument for robotic assisted radiofreqency ablation."
- 21st International Conference on System Theory, Control and Computing, ICSTCC 2017
- The TUIASI Doctoral School International Conference 22-23 May, 2019, Iasi, Romania. With the paper " LOWER LIMB REHABILITATION EXERCISE SIMULATION BASED ON A NOVEL REHABILITATION ROBOTIC SYSTEM"
- 41th International Conference on Mechanics of Solids, Acoustics and Vibrations "Prof. P.P. Teodorescu" ICMSAV XLI. 26. Oct. 2017. With the paper " An innovative automated instrument for robotically assisted brachtherapy used in cancer treatment"
- 16th International Symposium on Advances in Robot Kinematics, ARK 2018, 1 - 5 July 2018, Bologna. With the paper " On the Singularities of a Parallel Robotic System Used for Elbow and Wrist Rehabilitation"

Pending patents

- "Automated medical instrument with multiple parallel needles for the intersitital brachytherapy". Authors: Birlescu, I., Gherman, B., Burz, A., Pisla, D., patent pending A00710/06.11.2019.
- "Automated medical instrument for the insertion of brachytherapy needles on parallel trajectories". Authors: Gherman, B., Birlescu, I., Burz, A., Pisla, D., patent pending A00806/28.11.2019.
- "Automated medical instrument for the manipulation of a laparoscopic ultasound probe". Authors: Birlescu, I., Vaida, C., Gherman, B., Burz, A., Tucan, P., Plitea, N., Pisla, D., patent pending A00752/15.11.2019.
- "Automated medical instrument for robotic assisted biopsy". Authors: Vaida Călin, Bîrlescu Iosif, Gherman Bogdan, Tucan Paul, Plitea Nicolae, Pîslă Doina. Patent pending no. A/00936.
- "Automated medical instrument for robotic assisted ablation". Authors: D. Pisla, C. Vaida, I. Birlescu, F. Graur, B. Gherman, P. Tucan, N. Patent pending no. 00379.
- "Automated multi needle medical instrument for brachytherapy". Authors: D. Pisla, C. Vaida, I. Birlescu, F. Graur, B. Gherman, P. Tucan, N. Patent pending no. 00431

Cluj-Napoca, 06/12/2022