



Paul Tucan

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WORK EXPERIENCE

24/02/2020 – CURRENT Cluj-Napoca, Romania

LECTURER TECHNICAL UNIVERSITY OF CLUJ-NAPOCA

Teaching activity in :

- -computer programming
- -computer operation
- -parallel robots
- -medical robotics

01/10/2020 – CURRENT Cluj-Napoca, Romania

SCIENTIFIC RESEARCHER (3) TECHNICAL UNIVERSITY OF CLUJ-NAPOCA

Research activities in:

- robotics
- mechatronics
- computing and simulation techniques
- kinematics and dynamics of parallel robots
- surgical robots
- robotic assisted cancer treatment
- robotic medical rehabilitation

01/10/2015 – 23/02/2020 Cluj-Napoca, Romania

ASSISTANT PROFESSOR TECHNICAL UNIVERSITY OF CLUJ-NAPOCA

Teaching activity in:

- -computer programming
- -computer operation

01/10/2014 – 30/09/2020 Cluj-Napoca, Romania

SCIENTIFIC RESEARCH ASSISTANT TECHNICAL UNIVERSITY OF CLUJ-NAPOCA

Research activities in:

- robotics
- mechatronics
- computing and simulation techniques
- kinematics and dynamics of parallel robots
- surgical robots
- robotic assisted cancer treatment
- robotic medical rehabilitation

17/08/2011 – 30/09/2014 Cluj-Napoca, Romania

HEAD OF MACHINING UNIT SC. ARMATURA SA

- Coordinating the machining department
- Processing parts according to the production plan
- Completion of parts according to the delivery plan
- Preparation of the production plan within the department
- Human resources management within the machining department
- Preparing the work plan and auxiliary documents
- Preparation and procurement of the necessary materials
- Implementation and operation of the SAP software

- Maintenance team coordinator in the Machining and Assembly section;
- Preparation of plans for repair and maintenance.

EDUCATION AND TRAINING

01/10/2014 – 14/11/2018 Cluj-Napoca, Romania

PHD DIPLOMA Technical University of Cluj-Napoca

Website www.utcluj.ro | **Field of study** Mechanical Engineering | **Final grade** Magna Cum Laude

Thesis Development of new parallel robots for biopsy of the prostate

01/10/2010 – 30/06/2012 Cluj-Napoca, Romania

MASTER DIPLOMA Technical University of Cluj-Napoca

Website www.utcluj.ro | **Field of study** Mechatronics and Robotics

01/10/2006 – 30/06/2010 Cluj-Napoca, Romania

BACHELOR DIPLOMA Technical University of Cluj-Napoca

Website www.utcluj.ro | **Field of study** Mechatronics and Robotics

01/09/2002 – 30/06/2006 Cluj-Napoca, Romania

HIGHSCHOOL DIPLOMA Avram Iancu Theoretical Lyceum

Address 25 Onisifor Ghibu Street, Cluj-Napoca, Romania | **Website** www.avramiancucluj.ro/

Field of study Mathematics and Informatics

LANGUAGE SKILLS

Mother tongue(s): **ROMANIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	B2	B2	B2	B2	B2
FRENCH	A2	A2	A2	A2	A2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Microsoft Office | Computer Operation | C, C++c C# | Software Development (Matlab, Scilab, Maple, Pascal, Python) | Html, Java, CSS | Video editing (Filmora, Premiere...) | GIMP Basics | Automation studio | SIEMENS NX (Good) | Autocad and Solidworks | Inkscape 0.91

● Publications

Rus, G.; Andras, I.; Vaida, C.; Crisan, N.; Gherman, B.; Radu, C.; Tucan, P.; Iakab, S.; Hajjar, N.A.; Pisla, D. Artificial Intelligence-Based Hazard Detection in Robotic-Assisted Single-Incision Oncologic Surgery. *Cancers* 2023, 15, 3387. <https://doi.org/10.3390/cancers15133387>

Covaciu, F.; Crisan, N.; Vaida, C.; Andras, I.; Pusca, A.; Gherman, B.; Radu, C.; Tucan, P.; Al Hajjar, N.; Pisla, D. Integration of Virtual Reality in the Control System of an Innovative Medical Robot for Single-Incision Laparoscopic Surgery. *Sensors* 2023, 23, 5400. <https://doi.org/10.3390/s23125400>

Tohanean, N.; Tucan, P.; Vanta, O.-M.; Abrudan, C.; Pinte, S.; Gherman, B.; Burz, A.; Banica, A.; Vaida, C.; Neguran, D.A.; et al. The Efficacy of the NeuroAssist Robotic System for Motor Rehabilitation of the Upper Limb—Promising Results from a Pilot Study. *J. Clin. Med.* 2023, 12, 425. <https://doi.org/10.3390/jcm12020425>

Tucan, P.; Vaida, C.; Horvath, D.; Caprariu, A.; Burz, A.; Gherman, B.; Iakab, S.; Pisla, D. Design and Experimental Setup of a Robotic Medical Instrument for Brachytherapy in Non-Resectable Liver Tumors. *Cancers* 2022, 14, 5841. <https://doi.org/10.3390/cancers14235841>

Pisla, D.; Birlescu, I.; Crisan, N.; Pusca, A.; Andras, I.; Tucan, P.; Radu, C.; Gherman, B.; Vaida, C. Singularity Analysis and Geometric Optimization of a 6-DOF Parallel Robot for SILS. *Machines* 2022, 10, 764. <https://doi.org/10.3390/machines10090764>

Tarnita, D.; Geonea, I.D.; Pisla, D.; Carbone, G.; Gherman, B.; Tohanean, N.; Tucan, P.; Abrudan, C.; Tarnita, D.N. Analysis of Dynamic Behavior of ParReEx Robot Used in Upper Limb Rehabilitation. *Appl. Sci.* 2022, 12, 7907. <https://doi.org/10.3390/app12157907>

Gherman B, Hajjar NA, Tucan P, Radu C, Vaida C, Mois E, Burz A, Pisla D. Risk Assessment-Oriented Design of a Needle Insertion Robotic System for Non-Resectable Liver Tumors. *Healthcare (Basel)*. 2022 Feb 18;10(2):389. doi: 10.3390/healthcare10020389. PMID: 35207006; PMCID: PMC8872014.

Geonea, I.D.; Tarnita, D.; Pisla, D.; Carbone, G.; Bolcu, A.; Tucan, P.; Georgescu, M.; Tarniță, D.N. Dynamic Analysis of a Spherical Parallel Robot Used for Brachial Monoparesis Rehabilitation. *Appl. Sci.* 2021, 11, 11849. <https://doi.org/10.3390/app112411849>

Birlescu, I.; Husty, M.; Vaida, C.; Gherman, B.; Tucan, P.; Pisla, D. Joint-Space Characterization of a Medical Parallel Robot Based on a Dual Quaternion Representation of SE(3). *Mathematics* 2020, 8, 1086. <https://doi.org/10.3390/math8071086>

Tucan, P.; Vaida, C.; Plitea, N.; Pisla, A.; Carbone, G.; Pisla, D. Risk-Based Assessment Engineering of a Parallel Robot Used in Post-Stroke Upper Limb Rehabilitation. *Sustainability* 2019, 11, 2893. <https://doi.org/10.3390/su11102893>

● Patents and Patent requests

N. Plitea, D. Pisla, C. Vaida, B. Gherman, P. Tucan, C. Govor, F. Covaciu: Family of innovative parallel robots for transperineal prostate biopsy, Patent pending: A/00191/ 13.03.2015.

C. Vaida, D. Pisla, P. Tucan, N. Plitea, B. Gherman: Parallel robot for transperineal prostate biopsy. Patent pending 00761/26.10.2015.

C. Vaida, I. Birlescu, B. Gherman, P. Tucan, N. Plitea, D. Pisla: „Automated medical instrument for robotic assisted prostate biopsy” , Patent pending: A/00936/29.11.2016.

D. Pisla, C. Vaida, I. Birlescu, F. Graur, B. Gherman, P. Tucan, N. Plitea: „Automated medical instrument for radiofrequency ablation”, patent pending: A00379/10.06.2017.

D. Pisla, C. Vaida, I. Birlescu, F. Graur, B. Gherman, P. Tucan, N. Plitea: „Automated medical instrument with multiple needles for brachytherapy”, patent pending: A00431/12.09.2017.

Pisla, D., Birlescu, I., Vaida, C., Gherman, B., Tucan, P., Plitea, N. Parallel robot for lower limb rehabilitation, RO-133814/29.10.2021.

Parallel robot for mobility rehabilitation of the lower limb, Authors: Pislă Doina, Birlescu Iosif, Vaida Călin, Gherman Bogdan, Tucan Paul, Plitea Nicolae, patent pending A00334/04.06.2019.

Automated medical instrument for the manipulation of a laparoscopic ultrasound probe. Authors: Birlescu, I., Vaida, C., Gherman, B., Burz, A., Tucan, P., Plitea, N., Pisla, D. patent pending

PRoHep-LCT- Parallel robot for the minimally invasive treatment of hepatic carcinoma. Authors: Plitea, N., Pisla, D., Vaida, C., Gherman, B., Tucan, P. patent pending A1017/03.12.2018.

Parallel modular robotic system for the ultrasound intraoperative probe guidance and the manipulation of instruments for the treatment of hepatic tumors. Authors: Vaida, C., Pisla, D., Plitea, N., Gherman, B., Tucan, P. patent pending A01143/24.12.2018

Parallel robot for mobility rehabilitation of the lower limb, Pisla, D., Gherman, B., Nadas, I., Pop, N., Craciun, F., Tucan, P., Vaida, C., Carbone, G, Birlescu, I., Plitea, N., Patent number OSIM: RO133815/29.10.2021

Family of modular parallel robots with active translation joints for SILS", Authors: Pisla Doina, Birlescu Iosif, Vaida Calin, Tucan Paul, Gherman Bogdan, Plitea Nicolae, registration no. OSIM A00733/03.12.2021.

Family of modular robots for SILS with kinematic constraint at the insertion point", Authors: Vaida Calin, Pisla Doina, Birlescu Iosif, Gherman Bogdan, Tucan Paul, Plitea Nicolae, registration no. OSIM A00734/03.12.2021.

Parallel robotic system for bilateral medical recovery of the shoulder joint, Tucan, P., Pisla, D., Vaida, C., Pisla, A., Gherman, B., Birlescu, I., no. OSIM registration: A / 00683-12.11.2021

● **Member in research projects**

Challenge - New frontiers in robotic assisted single port surgery: a novel robotic system with dexterous instruments. National Exploratory Project, financed by the Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI) Project code: PN-III-P4-ID-PCE-2020-0572-PCE-171, Contract no: PCE 171 from 17/02/2021, Project duration: 2021-2023. Project Coordinator: Prof. Dr. Ing. Doina PISLA

Enhance - Innovative safe robotic system for enhanced patient-centered treatment of liver cancers. National Experimental Demonstration Project, financed by the Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI) Project code: PN-III-P2-2.1-PED2021-2790, Contract no: 694PED from 24/06/2022, Project duration: 2022-2024. Project Coordinator: Prof. Dr. Ing. Doina Pisla

Hope2Walk - An innovative modular rehabilitation robot for the efficient therapy of lower limb motor deficit. National Experimental Demonstration Project, financed by the Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI) Project code: PN-III-P2-2.1-PED2021-3430, Contract no: 608PED from 24/06/2022, Project duration: 2022-2024. Project Coordinator: Prof. Dr. Ing. Calin Vaida

Wisdom of Age - A Seniors Digital Platform for Knowledge Transfer towards Industrial Companies. Project funded by AAL Programme, co-funded by the European Commission and National Funding Authorities of Romania, Switzerland and Belgium, Project code: aal-2020-7-83-CP. UTCN responsible: Prof. Dr. Ing. Doina PISLA

APOLLO - Intelligent tele-robotic systems for the personalised treatment of neuromotor deficit to increase the patients quality of life. Project funded through Competitiveness Operational Programme 2014-2020, with the support of the European Union, under the Call Innovative Technological Projects - 2022, no. 34007/13.01.2023, UTCN responsible: Prof. Dr. Ing. Doina PISLA.

NeuroAssist - An innovative modular robotic system for the rehabilitation of brachial monoparesis. National Experimental Demonstration Project, financed by the Executive Agency for Higher Education, Research,

Development and Innovation Funding (UEFISCDI) Project code: PN-III-P2-2.1-PED2019-3022, Contract no: 546PED from 02/11/2020, Project duration: 2020-2022. Project Coordinator: Prof. Dr. Ing. Doina Pisla

OnTarget - Innovative robotic guided instruments for the treatment of malignant tumors. National Experimental Demonstration Project, financed by the Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI) Project code: PN-III-P2-2.1-PED2019-4375, Contract no: 397PED from 02/11/2020, Project duration: 2020-2022. Project Coordinator: Prof. Dr. Ing. Calin VAIDA

SAFE - Robotic Assisted Protection Cabin for Collecting Biological Samples with Airported Pathogens. National Technological Transfer Project, financed by the Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI) Project code: PN-III-P2-2.1-PTE-2019-0160, Contract no: 65 PTE/2020 from 01/09/2020, Project duration: 2020-2022. Project Coordinator: Prof. Dr. Ing. Doina PISLA

IMPROVE - High accuracy innovative approach for the robotic assisted intraoperative treatment of hepatic tumors based on imagistic-molecular diagnosis. National Complex Project for Research, Development and Innovation, financed by the Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI) Project code: PN-III-P1-1.2-PCCDI2017-0221, Contract no: 59/1 March 2018 , Project duration: 2018-2020. Project Coordinator: Prof. Dr. Ing. Doina PISLA

AgeWell - Innovative Approaches Regarding Rehabilitation and Assistive Robotics for Healthy Ageing. Competitiveness Operational Programme 2014-2020, Priority Axis 1 – Research, Technological Development and Innovation (Rd&I) to Support Economic Competitiveness and Business Development. Co-financed through the European Fund for Regional Development Project code: ID P_37_215 MySMIS 2014 Code: 103415. Implementation period: September 2016-August 2020. Project coordinated by the Technical University of Cluj-Napoca (CESTER). Project manager: Prof. Dr. Ing. Carbone GIUSEPPE

Heal4Liv - Innovative robotic system for cancer treatment. Financed by the European Institute of Innovation and Technology (EIT-Health) through InnoStars. Implementation period: April 2020-December 2020. Project coordinated by the Technical University of Cluj-Napoca (CESTER). Project manager: PConf. Dr. Ing. Bogdan Gherman

InnoHealth - An innovative robotic system for upper limb rehabilitation. Financed by the European Institute of Innovation and Technology (EIT-Health) through InnoStars. Implementation period: August 2019-December 2019. Project coordinated by the Technical University of Cluj-Napoca (CESTER). Project manager: Prof. Dr. Ing. Doina PISLA

ROBOCORE - Robotic assisted prostate biopsy, a high precision innovative method. National project PCCA TIP 2, financed by Executive Unit for High Education Financing, Research, Development and Innovations (UEFISCDI) Project code : PN-II-PT-PCCA-2013-4-0647, Contract number: 247/2014, Project duration: 2014-2016. Project manager: Prof. Dr. Ing. Doina PISLA

ACCURATE - A multi-purpose Needle Insertion device for the diagnosis and treatment of cancer. National project PCCA TIP 2, financed by Executive Unit for High Education Financing, Research, Development and Innovations (UEFISCDI) Project code : PN-II-RU-TE- 2014-4-0992, Contract number: 59 /2015, Project duration: 2015-2017. Project manager: Assoc. Prof. Dr. Ing. Calin Vaida

SPINE - Diagnosis and therapy system for spine disorders. National project PCCA TIP 2, financed by Executive Unit for High Education Financing, Research, Development and Innovations (UEFISCDI) Project code : PN-II-PT-PCCA-2013-4-1596, Contract number: 227/2014, Project duration: 2015-2017. Project coordinated by the "Transilvania" University of Brasov, Project manager: Assoc. Prof. Dr. Ing. Butnariu Silviu

Bilateral research project Romania-Austria: Developing methods to evaluate the accuracy of potential parallel robots for medical applications, Project no 745/2014 (2014-2015), Director Romania: Prof. Doina Pisla, Director Austria: Prof. Manfred Husty.