

Roman Kamnik
Curriculum Vitae

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Roman Kamnik received the B. Sc., M.Sc., and D.Sc degrees in Electrical Engineering from the University of Ljubljana, Faculty of Electrical Engineering, Ljubljana, Slovenia, in 1992, 1995, and 1999, respectively.

He was Research Assistant at University of Ljubljana, Faculty of Electrical Engineering, Slovenia, and at the University of Glasgow, Department of Mechanical Engineering, Great Britain. He was also a Visiting Research Fellow at University of Alberta, Faculty of Medicine and Oral Health Sciences, Department of Biomedical Engineering, Canada. He is currently a staff member of the Laboratory of Robotics and Professor at Faculty of Electrical Engineering, University of Ljubljana. He is teaching subjects on robotics, biomechanics, intelligent transport systems, and embedded systems.

His research interests are focussed to the biomedical engineering and robotics. He is specialized in the development of robotic systems and sensors for the applications in sport, industrial or rehabilitation environment. For his research work he was awarded by the Government Office for the Disabled and Chronically Sick of the Republic of Slovenia with the acknowledgement, and Slovenian Ministry of Science and Technology and ISKRA Holding with the Bedjanič award. Professor Kamnik is a member of IEEE, IFESS and a chair of Robotics section of Slovenian Society for Automatic Control.

Formal education:

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| 1999 | D.Sc., Electrical Engineering, University of Ljubljana
Subject: Sensory information in standing-up of paraplegic patients |
| 1995 | M.Sc., Electrical Engineering, University of Ljubljana
Subject: Adaptive control of robot manipulator in contact with environment |
| 1992 | B.Sc., Electrical Engineering, University of Ljubljana
Subject: Robot assembly of wired resistors into pallet |

Habilitation:

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| 2014 | Full professor, University of Ljubljana |
| 2009 | Associate professor, University of Ljubljana |
| 2000, 2005 | Assistant professor, University of Ljubljana |
| 1999 | Lecturer, University of Ljubljana |
| 1995, 1998 | Assistant, University of Ljubljana |

Employment:

- 2013 - Professor, Faculty of Electrical Engineering, University of Ljubljana
- 1998 - 2013 Teaching and Research Assistant, Faculty of Electrical Engineering, University of Ljubljana
- 1995 -1998 Research Assistant, Faculty of Electrical Engineering, University of Ljubljana
- 1992 -1995 Research fellow from TAB, d.o.o. Mežica industrial partner at Faculty of Electrical Engineering, University of Ljubljana

Awards:

- 2023 The Rector's award for the best innovation of the University of Ljubljana, 2nd prize for ReGrip robotic rehabilitation device. Inventors Ana Mandeljc, Aleksander Rajhard, Roman Kamnik, October 2023.
- 2010 Member of the project which won the 3rd prize of The 2010 EUROP/EURON Robotics Technology Transfer Award, San Sebastian, March 11, 2010.
- 2009 "Best application paper award", 18th International Workshop on Robotics in Alpe-Adria-Danube region, May 2009, Brasov, Romania.
- 2002 Year 2002 acknowledgement from the Government Office for the Disabled and Chronically Sick of the Republic of Slovenia.
- 1995 Award of Prof. Dr. Vratislav Bedjanič for Master theses. Holding ISKRA d.d. and Ministry of Science and Technology, Republic of Slovenia.

Participation in research projects:

- 2022-2025 Physical Cognition for Intelligent Control and Safe Human-Robot Interaction, SESTOSENSE, HORIZON-RIA Programme, HORIZON-CL4-2021-DIGITAL-EMERGING-01-11. Agreement No. 101070310, 1.10.2022-30.9.2025. Principal investigator at ULFE.
- 2022 - 2027 Motion analysis and synthesis in human and machine, research program P 0228, Slovenian Research Agency, ARRS. Researcher.
- 2019-2022 Additive Process Technology Integration with Management and Entrepreneurship, APTIME, ERASMUS+ Programme – Key Action 2: Strategic Partnership, Agreement No. 2019-1-UK01-KA203-062066, 1.9.2019-31.12.2022. Principal investigator at FE.
- 2018-2022 Post-clinical rehabilitation of stroke patients at home at the year 2030 – Telerehabilitation as user oriented service, REHA 2030, Interreg V-A, Slovenia-Austria, ESRR no. SIAT258, 1.1.2019-31.06.2022. Principal investigator at ULFE.
- 2017-2020 The CYBERnetic LowEr-Limb CoGnitive Orthoprosthesis Plus Plus — CYBERLEGS Plus Plus, H2020-ICT-25-2016-2017, Grant Agreement Number 731931. Researcher.

- 2016-2019 Development of multiaxis robotic 3D printing of composite materials, MMO3D, Interreg V-A, Slovenia-Austria, ESRR no. SIAT73, 1.9.2016-31.8.2019. Principal investigator at ULFE.
- 2015 - 2021 Motion analysis and synthesis in human and machine, research program P 0228, Slovenian Research Agency, ARRS. Researcher.
- 2012-2015 CYBERLEGS: Information and Communication Technologies Collaborative Project, The CYBERnetic LowEr-Limb CoGnitive Ortho-prosthesis FP7-ICT-2011-7, Grant Agreement Number 287894. Researcher.
- 2011 - 2013 The development of advanced control algorithms for robotic device for standing-up training, Slovenia-China cooperation in science and technology, ARRS, Slovenia, BI-CN/11-13-021. Leading partner. Principal investigator.
- 2009 - 2014 Motion analysis and synthesis in human and machine, research program P 0228, Slovenian Research Agency, ARRS. Researcher.
- 2007 - 2009 Development of FES system and electrically driven robot assistive device for standing-up capability augmentation in impaired subjects, Slovenia-China cooperation in science and technology, ARRS, Slovenia, BI-CN/07-09-025. Leading partner. Principal investigator.
- 2008 – 2009 Development of new neuroprosthesis and assessment tools for impaired people due to a CNS lesion, Romania-Slovenia cooperation in science and technology, ARRS, Slovenia, BI-RO/08-09/012. Leading partner. Principal investigator.
- 2006 - 2008 System for analysis of exploitation capabilities of army vehicles, CRP research program "Knowledge for Safety and Peace 2006-2010", M2-0126, MORS and ARRS, Slovenia. Principal investigator at FE.
- 2006 – 2008 Mobile robot system for surveillance, research and rescue operations, CRP research program "Knowledge for Safety and Peace 2006-2010", M2-0116, MORS and ARRS, Slovenia. Principal investigator in Robolab.
- 2007 - 2009 TRIMO Development of E Technology of Assembly - industrial project, financed by enterprise Trimo, d.o.o., Trebnje, Slovenia. The project won 3rd prize of The 2010 EUROP/EURON Robotics Technology Transfer Award, San Sebastian, March 11, 2010. Researcher.
- 2004 – 2006 System for interactive assessment of vehicle and passenger dynamics" - CRP research program "Knowledge for Safety and Peace 2004 - 2010, M2-0023, MORS and ARRS, Slovenia. Principal investigator at FE.
- 2005 – 2006 Standing up motion augmentation in paraplegia by means of FES and robot technology, Romania-Slovenia cooperation in science and technology, MŠZŠ, Slovenia, BI-RO/05-06/007. Leading partner. Principal investigator.
- 2004 - 2008 Motion analysis and synthesis in human and machine, research program P 0228, Republic of Slovenia Ministry of Science and Technology. Researcher.
- 2004 Automation of assembly of electronic boards into housing – industrial project,

financed by Center ARI (Tehnološki center za avtomatizacijo, robotizacijo in informatizacijo proizvodnje) for enterprise Pick&Place, Portorož. Principal investigator.

- 2003 - 2004 Development of sensory supported FES system for restoring standing-up and sitting down in paraplegia, Romania-Slovenia cooperation in science and technology, MŠZŠ, Slovenia, BI RO 03 04-003. Leading partner. Principal investigator.
- 2001 - 2003 Modern statistical approaches to off-equilibrium modelling for nonlinear system control, ESPRC GR/M76379/01, Great Britain. Researcher.
- 2000 Rollover prevention of heavy freight vehicles, project financed by Daimler Chrysler, Germany and Freightliner, USA, performed at University of Glasgow, Department of Mechanical Engineering, Glasgow, Great Britain. Postdoc project.
- 1999 - 2003 Analysis and synthesis of movement in man and machine, Republic of Slovenia Ministry of Science and Technology, 1538-505. Researcher.
- 1996 - 1999 SENSATIONS (Standing with Electrical Neuromuscular Stimulation Applying Tactile and Proprioceptive Information Obtained from Natural Sensors) BIOMED 2 - FW 4, European Commission, PL95 – 0897. Researcher.
- 1999 - 2001 Four point dynamic walking using FES - Slovenia, project MZT J2-7496 (D). Researcher.
- 1997 - 1998 Robot assembly cell for car battery production - Slovenia, project MZT L2-8601 (D). Researcher.

Participation in projects financed by other EU funds:

- 2022 – 2025 Additive digital technologies for building of composite elements (in Slovene Dodajalne digitalne tehnologije za gradnjo kompozitnih elementov), 17-ULTRA_6.02, pilot Environmental technologies, University of Ljubljana, UL for a sustainable society (ULTRA, Pilot projects for the renewal of higher education for a green and resilient transition MZZŠ C3330-22-953013, 1.7.2022 – 31.12.2025, EU Recovery and Resilience Plan funds. Principal investigator at ULFE.
- 2022 – 2025 Digital and in a sustainable society oriented study program of Mechanical Engineering (in Slovene Digitalni in v trajnostno družbo naravnani študijski program strojništva), 17-ULTRA_3.02, pilot Environmental technologies, University of Ljubljana, UL for a sustainable society (ULTRA), Pilot projects for the renewal of higher education for a green and resilient transition MZZŠ C3330-22-953013, 1.7.2022 – 31.12.2025, EU Recovery and Resilience Plan funds. Principal investigator at ULFE.
- 2022 – 2025 Open laboratory for multidisciplinary and multicultural creativity (in Slovene Odprti laboratorij za multidisciplinarno in multikulturno kreativnost), 17-ULTRA_3.03, pilot Innovative learning environments, University of Ljubljana, UL for a sustainable society (ULTRA, Pilot projects for the renewal of higher education for a green and resilient transition MZZŠ C3330-22-953013, 1.7.2022 – 31.12.2025, EU Recovery and Resilience Plan funds. Principal investigator at ULFE.

International research:

- 2000 (8 months) University of Glasgow, Department of Mechanical Engineering, Great Britain. Project: Automatic rollover prevention of heavy freight vehicles. Project was financed by DaimlerChrysler, Germany and Freightliner, USA.
- 1997 (3 months) University of Alberta, Faculty of Medicine and Oral Health Sciences, Department of Biomedical Engineering, Canada. Project: Study of arm and FES supported standing-up of paraplegic subjects.

Organizing of scientific meetings:

- 2009-2022 International Workshop on Robotics in Alpe-Adria-Danube Region – RAAD - member of International Scientific Committee
- 2014-2023 International Electrotechnical and Computer Science Conference - ERK, Portorož, Slovenia – member of Program Committee (organizer of section Robotics)
- 2007 17th International Workshop on Robotics in Alpe-Adria-Danube Region – RAAD 2007, Ljubljana, Slovenia – cochair
- 2005-2015 Conference on Automatization in industry and economy - AIG, Maribor (biental), organizing committee.
- 2002 7th Annual Conference of the International Functional Electrical Stimulation Society - IFESS 2002, Ljubljana - organizing committee

Teaching:

- 2013 - Robotics and Production Systems (lecture), 3rd year, 1st level program
Faculty of Electrical Engineering, University of Ljubljana
- 2013 - Design of Electromechanical Assemblies (lecture), 1st year, 2nd level master program,
Faculty of Electrical Engineering, University of Ljubljana
- 2012 - Module C - Biomechanics (lecture and laboratory practice), 1st year, 2nd level master
program, Faculty of Electrical Engineering, University of Ljubljana
- 2012 - Robotic and Measurement Embedded Systems (lecture), 1st year, 2nd level master
program, Faculty of Electrical Engineering, University of Ljubljana
- 2005 - Intelligent Mobile Robots and Transport Systems (lecture), PhD program,
Faculty of Electrical Engineering, University of Ljubljana
- 2011/12 Automated Infrastructure and Intelligent Systems (lecture), 1st year, 2nd level master
program, Faculty of Mechanical Engineering, University of Ljubljana
- 1998 - 2012 Biomechanics (lecture and laboratory practice), 5th year undergraduate program,
Faculty of Electrical Engineering, University of Ljubljana
- 1995 - 1997 Control and Optimization of Technical Systems, undergraduate, 4th year
Faculty of Maritime Studies and Transport, Portorož, University of Ljubljana

1995 - 2013 Basics of Robotics, Robotics II, Microcomputer systems (laboratory practice)
Faculty of Electrical Engineering, University of Ljubljana

International teaching:

2019 Robot Dynamics and Control, University Immersion Program, Summer School,
1.7. – 12.7.2019, Sichuan University, Chengdu, China.

2014 - 2021 Robotics and Prosthetics in Medicine (lecture), 1st year, 2nd level master program
Health Care IT, Carinthia University of Applied Science, Klagenfurt am Wörthersee,
Austria.

2013 - 2022 Robot Dynamics (lecture), 1st year, 2nd level master program Engineering &IT, System
Design, Carinthia University of Applied Science, Villach, Austria.

Mentorship of student projects financed by EU funds:

2018/19 Green naval vessel. Project ŠIPK - Študentski inovativni projekti za družbeno korist
EU 11083/27/2019, SM 1163. Joint project of Faculty of Maritime Studies and
Transport, Portorož (3 students), Faculty of Electrical Engineering, Ljubljana (2
students), Faculty of Social Sciences, Ljubljana (1 student), and organization National
Institute of Biology, Marine Biology Station, Piran.

2017/18 Connected system for acquisition and analysis of roadway friction properties
(CONSKID). Project PKP - Getting practical knowledge by creative path. Joint project
of Faculty of Electrical Engineering, Ljubljana (2 students), Faculty of Mechanical
Engineering, Ljubljana (4 students), and company Cestel, d.o.o., Trzin.

2016/17 Monitoring with autonomous vessel. Project ŠIPK - Študentski inovativni projekti za
družbeno korist. Joint project of Faculty of Maritime Studies and Transport, Portorož
(3 students), Faculty of Electrical Engineering, Ljubljana (3 students), Faculty of
Social Sciences, Ljubljana (1 student), and organization National Institute of Biology,
Marine Biology Station, Piran.

2016/17 ROBOPRINT - Robotic additive manufacturing by welding (Robotic WAAM). Project
PKP - Getting practical knowledge by creative path. Joint project of Faculty of
Electrical Engineering, Ljubljana (3 students), Faculty of Mechanical Engineering,
Ljubljana (4 students), Academy of Fine Arts and Design, Ljubljana (1 student), and
organizations Daihen Varstroj, Lendava and Šolski center Novo mesto.

2016/17 Design of autonomous model of a sailing boat. Project PKP - Getting practical
knowledge by creative path. Joint project of Faculty of Maritime Studies and
Transport, Portorož (4 students), Faculty of Electrical Engineering, Ljubljana (3
students), Faculty of Mechanical Engineering, Ljubljana (1 student), and
organizations Technol d.o.o., Portorož and National Institute of Biology, Marine
Biology Station, Piran.

Mentorship of DSc theses:

- 2022 Stanko Kružić, Artificial Intelligence-based Methods for Interaction Force Estimation and Mediated Navigation of a Robot Manipulator on a Mobile Base. University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, Split, Croatia. Josip Musić mentor. Roman Kamnik co-mentor.
- 2015 Sebastjan Šlajpah, Wearable sensory system for measurement and assessment of standing-up, DSc theses, University of Ljubljana, Faculty of Electrical Engineering. Roman Kamnik mentor.
- 2014 Tomaž Černe, Ergometer rowing exercise with real-time feedback information, DSc theses, University of Ljubljana, Faculty of Electrical Engineering. Roman Kamnik mentor.
- 2010 Jernej Perdan, Training and assessment of hand sensorymotor capabilities, DSc theses, University of Ljubljana, Faculty of Electrical Engineering. Roman Kamnik mentor.
- 2009 David Jurman, Assessment of 3D orientation with integrated inertial and magnetic sensors, DSc theses, Marko Topič mentor. Roman Kamnik co-mentor.

Mentorship of MSc theses:

- 2016 Klemen Juvan, Robot cell for personalized cosmetics, MSc theses, University of Ljubljana, Faculty of Electrical Engineering. Roman Kamnik mentor.
- 2011 Blaž Zupan, Measurement system for stability analysis of multilegged support, MSc theses, University of Ljubljana, Faculty of Electrical Engineering. Roman Kamnik mentor.
- 2009 Peter Čepon, Experimental mobile robotic platform, MSc theses, University of Ljubljana, Faculty of Electrical Engineering. Roman Kamnik mentor.
- 2007 Josip Musić, Model based inertial measuring of the kinematics of sit-to-stand movement, MSc theses, University of Ljubljana, Faculty of Electrical Engineering. Roman Kamnik mentor, Vlasta Zanchi co-mentor.

Mentorship of diploma and master theses:

- 2001-2021 Supervision of 67 diplomas and Bologna master theses, out of which 5 were awarded:
- 2022 Ana Mandeljč, Mechanism of a robotic device for fingers and wrist exercising. Master theses awarded by Prešeren award (university level), Ljubljana. Roman Kamnik mentor.
- 2011 Tomaž Černe, Biomechanics of rowing on a simulator. Diploma theses awarded by Prešeren award (university level), Ljubljana. Roman Kamnik mentor.
- 2006 Aleš Hribar, Microcontroller teaching system. Diploma theses awarded by Trimo

research award, Trebnje. Roman Kamnik mentor, Marko Munih co-mentor.

2005 Tomaž Koritnik, Varying the object orientation in robot grasping. Diploma theses awarded by Vratislav Bedjanič award, Ljubljana. Tadej Bajd mentor, Roman Kamnik co-mentor.

2001 Gregorij Kurillo, Statics of human grasping. Diploma theses awarded by Prešeren award (university level), Ljubljana. Tadej Bajd mentor, Roman Kamnik co-mentor.

Management functions:

2017-2023 Vice Dean for Education, University of Ljubljana, Faculty of Electrical Engineering.

2006-2014 Vice-president of Slovenian Society for Automatic Control and chair of Robotics section.

Memberships:

IEEE Institute of Electrical and Electronics Engineers, Inc.
IFESS International Functional Electrical Stimulation Society
DAS Slovenian Society for Automatic Control

Personal:

Born February 4th, 1967 in Slovenj Gradec, Slovenia.
Slovenian citizenship, two children.
Spoken languages: Slovenian, English, German, Croatian.
Marathon runner (17x).
Active member of Old-timer Vehicles Association, Kamnik, Slovenia
(Yamaha Maxim, 1983; HD XLH 883, 1987)
Military service – Military police, comm. unit, Sarajevo 1985/86.
Veteran of Ten-Day War for Slovenia independence, June/July 1991.