

**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. Besides, he is also a part time lecturer at Carinthia University of Applied Sciences, Austria. He is teaching subjects on robotics, biomechanics, intelligent transport systems, and embedded systems. At Faculty of Electrical Engineering he is currently also Vice Dean for Education.

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 robotic section of Slovenian Society for Automatic Control.

**Formal education:**

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

**Awards:**

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| 2010 | Member of the project which won the 3 <sup>rd</sup> prize of The 2010 EUROP/EURON Robotics Technology Transfer Award, San Sebastian, March 11, 2010. |
| 2009 | “Best application paper award”, 18 <sup>th</sup> 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.

**Habilitation:**

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

**Participation in research projects:**

2018-2021 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, 1.11.2018-30.10.2021. Principal investigator at FE.  
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 FE.  
2014 - 2020 Motion analysis and synthesis in human and machine, research program P 0228, Republic of Slovenia Ministry of Science and Technology. 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. Principal investigator.

- 2008 - 2014 Motion analysis and synthesis in human and machine, research program P 0228, Republic of Slovenia Ministry of Science and Technology. 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. 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. 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 3<sup>rd</sup> 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. 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. 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.

**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:**

- 2009-2018      International Workshop on Robotics in Alpe-Adria-Danube Region – RAAD - member of International Scientific Committee
- 2014-2018      International Electrotechnical and Computer Science Conference - ERK, Portorož, Slovenia – member of Program Committee (organizer of section Robotics)
- 2007              17<sup>th</sup> 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 (bienio), organizing committee.
- 2002              7th Annual Conference of the International Functional Electrical Stimulation Society - IFESS 2002, Ljubljana - organizing committee

**Teaching:**

- 2014 -              Robotics and Prosthetics in Medicine (lecture), 1<sup>st</sup> year, 2<sup>nd</sup> level master program Health Care IT, Carinthia University of Applied Science, Klagenfurt, Austria
- 2013 -              Robot Dynamics (lecture), 1<sup>st</sup> year, 2<sup>nd</sup> level master program Engineering &IT, System Design, Carinthia University of Applied Science, Villach, Austria
- 2013 -              Robotics and Production Systems (lecture), 3<sup>rd</sup> year, 1<sup>st</sup> level program Faculty of Electrical Engineering, University of Ljubljana
- 2013 -              Design of Electromechanical Assemblies (lecture), 1<sup>st</sup> year, 2<sup>nd</sup> level master program,

Faculty of Electrical Engineering, University of Ljubljana

- 2012 - Module C - Biomechanics (lecture and laboratory practice), 1<sup>st</sup> year, 2<sup>nd</sup> level master program, Faculty of Electrical Engineering, University of Ljubljana
- 2012 - Robotic and Measurement Embedded Systems (lecture), 1<sup>st</sup> year, 2<sup>nd</sup> 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), 1<sup>st</sup> year, 2<sup>nd</sup> level master program, Faculty of Mechanical Engineering, University of Ljubljana
- 1998 - 2012 Biomechanics (lecture and laboratory practice), 5<sup>th</sup> year undergraduate program, Faculty of Electrical Engineering, University of Ljubljana
- 1995 - 1997 Control and Optimization of Technical Systems, undergraduate, 4<sup>th</sup> 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

**Mentorship of student projects financed by EU funds:**

- 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:**

- 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 comentor.

### **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 comentor.

### **Mentorship of diploma and master theses:**

- 2001-2017      Supervision of 63 diplomas and Bologna master theses, out of which 4 were awarded:
- 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 comentor.
- 2005            Tomaž Koritnik, Varying the object orientation in robot grasping. Diploma theses awarded by Vratislav Bedjanič award, Ljubljana. Tadej Bajd mentor, Roman Kamnik comentor.
- 2001            Gregorij Kurillo, Statics of human grasping. Diploma theses awarded by Prešeren award (university level), Ljubljana. Tadej Bajd mentor, Roman Kamnik comentor.

**Memberships:**

IEEE Institute of Electrical and Electronics Engineers, Inc.  
IFESS International Functional Electrical Stimulation Society  
DAS Slovenian Society for Automatic Control (chair of Robotics section, vice-president  
2006-2014)

**Personal:**

Born February 4th, 1967 in Slovenj Gradec, Slovenia.  
Slovenian citizenship, two children.  
Spoken languages: Slovenian, English, Croatian, German (passive).  
Marathon runner (17x).  
Active member of Old-timer Vehicles Association, Kamnik, Slovenia  
(Yamaha Maxim, 1983; Harley Davidson XLH 883, 1987)  
Veteran of 10 days war for Slovenia independence.