

Curriculum Vitae

First and Last Name: **Jürgen LEITNER** Nationality: **Austrian** Date of birth: **July 27, 1983**
Spoken Languages: English (fluent), German (native), Italian (intermediate), Swedish (basic)

Current Positions

Post-doctoral Research Fellow / Project Lead, Manipulation & Vision since Nov 2014
Queensland University of Technology (QUT), ARC Centre of Excellence in Robotic Vision (ACRV)
creating robots that see and do by investigating novel approaches for integrating machine learning, computer vision, and robotics. Developing robotic vision systems and robotic demonstrators for real-world manipulation & object recognition. Building robot prototypes for novel concepts (such as Cartman, and the LunaRoo). Leader of the Amazon Robotics Challenge 2017 winning team & ACRV research **project leader** *Manipulation and Vision*. Supervision of 35+ undergrads, 10 PhD students, 35+ papers authored at QUT. <http://roboticvision.org>

Co-Founder, LYRO Robotics, Brisbane, Australia since Jul 2018
LYRO is a early-stage startup developing the technologies to create general-purpose pick-and-place robotic solutions by integrating machine learning, computer vision, and hardware development. Building on the success of Cartman and around technologies developed during the Amazon Robotics Challenge. <http://LYRO.IO>

Research Experience

Researcher, Artificial Intelligence and Robotics, Lugano, Switzerland Oct 2010 - Sep 2014
Istituto Dalle Molle di Studi sull'Intelligenza Artificiale (IDSIA): first author of 10+ publications on the lab's cutting-edge research in robotics, computer vision machine learning and control, within various EU projects (STIFF, IM-CLeVeR, WAY), mainly applied on the iCub humanoid <http://www.idsia.ch/~leitner/>

Young Graduate Trainee, European Space Agency, Noordwijk, Netherlands Oct 2010 - Sep 2014
Advanced Concepts Team (ACT): research on neuro-controller for autonomous spacecraft (s/c) docking, multi-agent simulation of fractionated s/c, "Space for Security": technical analysis of strategic & advanced concepts, reporting/studies on possible dual-use technologies in disaster response <http://www.esa.int/act>

Co-Founder, SpaceMaster Robotics Team, Tünnitz, Austria 2008 - 2010
development of projects: design of prototype assistant robot for space operations (Student Design Competition, **HRI 2008**), development & integration of stratospheric balloon payload (**HALE mission**, Reno), testing the feasibility of micro-gravity generation with a robotic reeling system (funding: Austrian Space Applications Program) and follow up mission *reel.SMRT* with ESA/DLR sponsorship flown on **BEXUS, SMURFS** project on multi-robot cooperation and reconfiguration for space exploration (**IJCAI 2009**) <http://smrt.name/>

Programmer/Researcher, Instituto Superior Técnico, Lisboa, Portugal Jul - Sep 2007
implementing/testing fast 3D stereo vision algorithms in OpenCV/C++ on the iCub <http://vislab.isr.ist.utl.pt/>

University Education

PhD Programme, Informatics (Artificial Intelligence and Robotics) 2011 - 2014
Università della Svizzera Italiana: intelligent, autonomous and adaptable humanoid robots
Supervisors: Dr. Alexander Förster, Prof. Jürgen Schmidhuber <http://www.inf.usi.ch/>

Joint European Master Degree, Space Science & Technology (SpaceMaster) 2007 - 2009
Helsinki University of Technology: *Master of Science in Technology*, Space Robotics and Automation
Luleå Technical University: *Master of Science, Space Technology*
MSc Thesis: "Multi-Robot Cooperation for Area Coverage in Space Exploration"
Supervisors: Tapio Taipalus, Prof. Shinichi Nakasuka, Prof. Kalevi Hyypä, Prof. Aarne Halme
Study Abroad: *Intelligent Space Systems Laboratory, University of Tokyo* (東京大学) <http://www.spacemaster.eu/>

BSc Degree, Software & Information Engineering 2003 - 2007
Vienna University of Technology: Bachelor of Science in Computer Science <http://www.cs.tuwien.ac.at/>

Honours and Awards

Amazon Robotics, Best Systems Paper Finalist 2018
Australian Centre for Robotic Vision, Best Profile Raising Award 2018
Queensland University of Technology, Vice Chancellor Performance Award (Team) 2018
Australasian Conference on Robotics & Automation, Best Paper Finalist 2017
Australian Centre for Robotic Vision, Best Team Project & Profile Raising Award 2017

Australian Centre for Robotic Vision, Best Team Project & Profile Raising Award	2016
Queensland University of Technology, Guest Lecture Honourable Mention Award	2016
EU FET Empowering Young Researchers Science Incubator, Selected Finalist	2014
Association for the Advancement of AI (AAAI) "Shakey" Video Awards, Best Student Video	2013
Joint Conference on Development and Learning and Epigenetic Robotics, Paper of Excellence	2012
Associate Fellow, Marie Curie Robotics for Development of Cognition (RobotDoc)	2012

Funding Attracted

I have attracted funding from various sources (governmental & industry) over my years as student and academic in total **240,000+ AUD** and **100,00+ USD** since joining QUT. The following is a short selection:

(65k USD) Mining3, Seed Project, Manipulation for Maintenance	2018
(95k USD) Amazon Robotics, Amazon Robotics Challenge Winning Team	2017
(10k AUD) Queensland University of Technology, Equipment Grant, DAVIS	2016
(7.75k AUD) Amazon Robotics, Participant Grant/Travel Stipend	2016
(5k AUD) Queensland University of Technology, Equipment Grant, LunaRoo	2015
(50k AUD) Prince Charles Hospital Foundation & QUT, Capital Equipment Grant, Robotic Arm	2015
(5k EUR) Austrian Space Applications Program (ASAP), Research Project Funding	2009
(1.5k EUR) European Space Agency (ESA) Scholarship, SpaceMaster course	2008

Professional Activities

Founder and organizer, Brisbane Robotics Interest Group	since 2015
outreach and networking events in Brisbane to bootstrap a robotics community	http://brig.Juxi.net
Vice Chair, Review Panel, CHIST-ERA "ORMR"	2018
review panel member: "Object recognition and manipulation by robots: Data sharing and experiment reproducibility"	
Founder and co-organizer, Brisbane AI	2016-2018
outreach, networking and training events in Brisbane to bootstrap the artificial intelligence community	http://brisbane.ai
Special Session Co-Organizer, "Machine Learning Methods applied to Vision and Robotics"	2017
will be held during IJCNN 2017	http://www.dtic.ua.es/~jgarcia/IJCNN2017/
Associate Editor, Special Issue "Deep Learning for Robotic Vision"	2017-2018
International Journal of Computer Vision (IJCV)	http://juxi.net/special-issue/ijcv-deep-learning-robotic-vision-2017/
Associate Editor, Special Issue "Limits and Potentials of Deep Learning in Robotics"	2016-2018
International Journal of Robotics Research (IJRR)	http://Juxi.net/special-issue/ijrr-deep-learning-2016/
Workshop Co-Organizer, "New Benchmarks for Deep Learning in Robotic Vision", R:SS 2017	2018
workshop at RSS 2018	https://sites.google.com/view/cvpr2018-robotic-vision
Workshop Co-Organizer, "Challenges and Benchmarks for Deep Learning in Robotic Vision"	2018
workshop at CVPR 2018	https://sites.google.com/view/cvpr2018-robotic-vision
Workshop Co-Organizer, "Deep Learning in Robotic Vision", CVPR 2017	2017
very successful workshop at CVPR (250)	http://juxi.net/workshop/deep-learning-robotic-vision-cvpr-2017/
Workshop Co-Organizer, "New Frontiers in Deep Learning in Robotics", R:SS 2017	2017
very successful workshop at Robotics: Science and Systems Conference (150)	http://juxi.net/workshop/deep-learning-rss-2017/
Workshop Organizer/Presenter, "2 Day Hands-On Workshop ROS"	2016 and 2017
creating an introduction to ROS for academics and industry partners (50+ participants)	http://Juxi.net/workshop/ros-2016/
Workshop Co-Organizer, "Limits and Potentials of Deep Learning in Robotics", R:SS 2016	2016
very successful workshop at Robotics: Science and Systems Conference (200)	http://Juxi.net/workshop/deep-learning-rss-2016/
Workshop Co-Organizer, "Deep Learning and its Applications in Vision and Robotics", ACRA/AI	2015
successful workshop (first for ACRA) with 80+ participants	http://Juxi.net/workshop/deeplearning-applications-vision-robotics-2015/
Winter School Co-Organizer, Queensland University of Technology (QUT)	2015
responsible for outreach, robotic demonstration and the hands-on robotic program/session	http://Juxi.net/WinterSchool/2015
Workshop Co-Organizer, Robotic Vision Summer School (RVSS)	2015 & 2016
creating the program for and running the hands-on robotics workshop	http://roboticvision.org/events/rvss-summer-school/
FET Empowering Young Explorers, "Lab Surfing" & "Science Incubator"	2014
took part in tutorials on preparing Horizon2002 FET proposals and project management techniques	https://fet-eye.eu/
American Institute of Aeronautics and Astronautics (AIAA), Member	since 2012
IEEE Robotics and Automation Society (RAS), Member	since 2012
Associate Editor, ICRA	2017-2018
Reviewer: various top-level conferences and journals, e.g. Journal of Field Robotics (JFR), ACM Trans. on Autonomous and Adaptive Systems, Robotics and Automation Letters (RA-L), ICRA, IROS, PLoS One,...	

Work Experience

- Consultant/eBusiness Developer, Wyeth Whitehall GmbH**, Vienna, Austria
implementing 10+ modules for a .NET based eBusiness back-end
Mar - Jul 2007
<http://www.wyeth.at/>
- Consultant/IT Manager, MLCompany GmbH**, Wilhelmsburg, Austria
planning/installing complete IT/network infrastructure based on Linux servers
Oct - Dec 2006
<http://www.mlcompany.at/>
- Consultant/Project Assistant, Mondi Business Paper**, Vienna, Austria
evaluating and reporting on the intranet structure, development of new concept
Jun - Aug 2006
<http://www.mondiibp.com/>
- PHP Developer, Sphinx Managed Services GmbH**, Vienna, Austria
implementing a front-end for server monitoring and fast querying of system status
Aug - Sep 2006
<http://www.sphinx-ms.at/>
- Co-Founder, EDV-Experts.at**, Türritz, Austria
consulting, development of webpages, implementation of IT systems/networks
2002 - 2010
<http://www.edv-experts.at/>
- Summer Internships/Placements**, Vienna, Austria
internships in various companies. programming and development of task automation tools, designing/creating webpages on Linux/Apache/mysql/PHP systems and server/IT administration
1999 - 2001

Teaching Experience

- Guest Lectures, Queensland University of Technology (QUT)** 2018
robotics and reinforcement learning lectures: "SEB104 Introduction to Science", and "CAB420 - Machine Learning"
- Guest Lectures, Queensland University of Technology (QUT)** 2017
robotics, reinforcement learning and project management lectures: "SEB104 Introduction to Science", "CAB420 - Machine Learning", "EGH444 - Digital Signals and Image Processing", and "ENB 329 Mechatronics Project"
- Guest Lectures, Queensland University of Technology (QUT)** 2016
(space) robotics lectures: "IFB 101 Impact of IT", "SEB104 Introduction to Science", and "ENB 329 Mechatronics Project"
- Guest Lectures, Queensland University of Technology (QUT)** 2015
(space) robotic lectures/demos "IFB101 Impact of IT" and "SEB104 Introduction to Science"
- Co-supervisor HDR students, Queensland University of Technology (QUT)** 2014 - 2018
supervisor for PhD students within QUT and the ACRV, deep learning and robotic vision
<http://Juxi.net/students>
- Research Advisor, Queensland University of Technology (QUT)** 2014 - 2018
for summer students, VRES and final year student projects (e.g. APC), computer vision and robotics
<http://Juxi.net/students>
- Research Co-Advisor, Università della Svizzera Italiana (USI)** 2013 - 2014
for BSc and MSc student diploma projects, including quad-rotors, vision and HRI
<http://Juxi.net/students>
- Teaching Assistant, Università della Svizzera Italiana (USI)** 2011 - 2014
for "Systems Programming", responsible for the "Lab", reviewing/grading homework
<http://www.idsia.ch/~leitner/>
- Student Assistant, Vienna University of Technology, Austria** 2006 - 2007
practical & lab sessions, student grading for "Usability Engineering" and "User Interface Design"
<http://deco.inso.tuwien.ac.at/>

Selected Publications

full list at <http://Juxi.net/papers/>

- F Zhang, J Leitner, Z Ge, M Milford, P Corke. **Adversarial Discriminative Sim-to-real Transfer of Visuomotor Policies. International Journal of Robotics Research (IJRR). (in print)** 2018
- Douglas Morrison, Peter Corke, Jürgen Leitner. **Closing the Loop for Robotic Grasping: A Real-time, Generative Grasp Synthesis Approach. R:SS. 2018.** June 2018
- Douglas Morrison, Adam Tow, ..., Jürgen Leitner. **Cartman: The low-cost Cartesian Manipulator that won the Amazon Robotics Challenge. ICRA.** May 2018
- Anton Milan, ... Peter Corke, Jürgen Leitner. **Semantic Segmentation from Limited Training Data. International Conference on Robotics and Automation (ICRA).** May 2018
- Quentin Bateux, Eric Marchand, Jürgen Leitner, Francois Chaumette, Peter Corke. **Visual Servoing from Deep Neural Networks. International Conference on Robotics and Automation (ICRA).** May 2018
- N. Sünderhauf, O. Brock, W. Scheirer, R. Hadsell, D. Fox, J. Leitner, B. Upcroft, P. Abbeel, W. Burgard, M. Milford, P. Corke. **The Limits and Potentials of Deep Learning for Robotics. International Journal of Robotics Research (IJRR). Vol 37:4-5,** 2018
- Jürgen Leitner, et al. **The ACRV Picking Benchmark: A Robotic Shelf Picking Benchmark to Foster Reproducible Research. International Conference on Robotics and Automation (ICRA).** May 2017
- Alexander Förster, Jürgen Leitner, Anne Förster. **Exciting Students for Systems Programming Through the Use of Mobile Robots. Journal of Engineering Education (JEE).** (in preparation)

- Adam Tow, Sareh Shirazi, *Jürgen Leitner*, Michael Milford, Ben Upcroft. **A Robustness Analysis of Deep Q Networks. Australian Conference on Robotics and Automation (ACRA).** Dec 2016
- Jürgen Leitner*, Simon Harding, Alexander Förster, Peter Corke. **A Modular Framework for Eye-hand Coordination in Humanoid Robots. Frontiers in Robotics and AI. Vol 3:26.** 2016
- Donald G. Dansereau, Surya PN Singh, *Jürgen Leitner*. **Interactive Computational Imaging for Deformable Object Analysis. International Conference on Robotics and Automation (ICRA).** May 2016
- Jürgen Leitner*, et al. **LunaRoo: Designing a Hopping Lunar Science Payload. IEEE AeroConf (Aerospace Conference).** Mar 2016
- Jürgen Leitner*, Donald G. Dansereau, Sareh Shirazi, Peter Corke. **The Need for Dynamic & Active Datasets. The Future of Datasets in Vision Workshop (at Computer Vision and Pattern Recognition - CVPR)** Jun 2015
- Jürgen Leitner*, Mikhail Frank, Alexander Förster, Jürgen Schmidhuber. **Reactive Reaching and Grasping on a Humanoid Towards Closing the Action-Perception Loop on the iCub. International Conference on Informatics in Control, Automation and Robotics (ICINCO).** Sep 2014
- Jürgen Leitner*, Alexander Förster, Jürgen Schmidhuber. **Improving Robot Vision Models for Object Detection Through Interaction. World Congress on Computational Intelligence -- International Joint Conference on Neural Networks (IJCNN): Robotics and Vision.** Jul 2014
- S. Harding, *Jürgen Leitner*, J. Schmidhuber. **Cartesian Genetic Programming for Image Processing (CGP-IP). in: Genetic Programming Theory & Practice X (Genetic & Evolutionary Comp Series).** Springer 2013
- Jürgen Leitner*, P. Chandrashekhariah, S. Harding, M. Frank, G. Spina, A. Förster, J. Triesch, J. Schmidhuber. **Autonomous Learning Of Robust Visual Object Detection And Identification On A Humanoid. IEEE Conference on Development and Learning (ICDL) / EpiRob. (Excellence Award)** San Diego Nov 2012
- Jürgen Leitner*, S. Harding, M. Frank, A. Förster, J. Schmidhuber. **Transferring Spatial Perception Between Robots Operating In A Shared Workspace. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).** 2012
- Jürgen Leitner*, C. Ampatzis, D. Izzo. **Evolving ANNs for Spacecraft Rendezvous and Docking. International Symposium on AI, Robotics & Automation in Space (i-SAIRAS).** Sep 2010

Extracurricular Studies

- Summer School, "Adaptive Systems", Bielefeld/CITEC** Sep 2016
 deep learning, event-based cameras, and neuro-morphic computing <https://www.cit-ec.de/en/summerschool>
- IEEE RAS Summer School, "Robot Vision and Applications"** Dec 2012
 tutorials on state-of-the-art Computer & Robot Vision techniques <http://www.amtc.cl/summerschool/>
- Summer School, The iCub Summer School, "Veni Vidi Vici"** Jul 2012
 development of the iCub code base and get-together of researchers <http://icub.org/summerschool/>
- Summer School, Neural Dynamics Approaches to Cognitive Robotics** Sep 2011
 tutorials on dynamic neural fields and application in humanoid robotics <http://www.robotics-school.org/>
- Summer School, JAIST International Robotics Summer School** Aug 2010
 tutorials on locomotive and cooperative robotic systems <http://www.jaist.ac.jp/robot/lcr2010/>
- Summer School, International School in Robotics and Intelligent Systems** Jul 2009
 tutorials on assistive robots & systems, incl. surgical and adaptive robots <http://www.isris.info/isris09.html>
- Exchange Program, ATHENS** Instituto Superior Tecnico (IST), Lisboa, Portugal 2007
 introduction to Robotics, Robotic Vision followed by an internship <http://www.ist.utl.pt/>
- Degree Studies, Computational Intelligence** 2005 - 2007
Vienna University of Technology: finished 75% (of the 120 ECTS) before joining SpaceMaster courses in Computer Science, Machine Learning and Artificial Intelligence <http://www.cs.tuwien.ac.at/>
- Exchange Program, ERASMUS** Royal Institute of Technology (KTH), Sweden 2005-2006
 courses in Distributed AI, Ubiquitous Computing, Artificial Neural Networks <http://www.kth.se/>
- Astronomy Programme, BSc** University of Vienna, Austria 2003-2005
 attended various courses in the field of Astronomy and Physics <http://astro.univie.ac.at/>

Mandatory Civil Service

- Austrian Red Cross, Türnitz and Lilienfeld, Austria** 2002 to 2003
 Ambulance driver and paramedic in the Emergency Response Team of the local Red Cross stations.

Primary Education

HTBLuVA - Higher Technical and Vocational College, St. Pölten, Austria
vocational, technical high-school in computer science and business management

1997 to 2002

<http://edvo.htlstp.ac.at/>

Federal Grammar School (BRG), Lilienfeld, Austria
(Junior) high-school with focus on natural science and mathematics.

1993 to 1997

<http://www.bglilienfeld.ac.at/>

Elementary School (Volksschule), Türnitz, Austria

1989 to 1993