Claus G. Smitt
AI Perception Roboticist

Contact
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Claus Smitt 🎓
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lvisroot 🔗

Languages
Spanish: Native
English: Adv. (C1)
German: Adv. (B2)
Italian: Basic (A2)

Skills
AI, Deep Learning, NeRF,
Differentiable Rendering,
3D geometry, SLAM,
Scene Understanding

Programming
Languages
Python, C/C++
Libraries
PyTorch, OpenCV, ROS,
sklearn, Pandas

References
Prof. Chris McCool
University of Bonn
cmccool@uni-bonn.de

Mario Munich
Embodied, Inc.
mariomu@gmail.com

Juan Tarrio
SLAMCore, Ltd.
juan.tarrio@gmail.com

Prof. Sol Pedre
CAREM25, CNEA
solpedre@gmail.com

Education

Since 2020	**PhD. Candidate**	**Institute of Agriculture, University of Bonn, Germany**
	Thesis: Robotic Vision for Precision Intervention in Horticulture.	
2014-2016	**Master of Engineering**	**Instituto Balseiro, Argentina**
	Thesis: Haptic telemanipulator for industrial robot arms.	
2008-2014	**Electrical Engineer**	**Universidad Nacional de Rosario, Argentina**
	Thesis: Active vibration cancelling for parallel robots.	
2005-2007	**Electrical Technician**	**Colegio San José Nº 8013, Argentina**

Experience

Since 01/20	**Research Assistant**	**Institute of Agriculture, University of Bonn, Germany**
	Deep learning perception systems for agricultural robotics. Phenorob cluster of excellence partner.	
01/19-12/19	**Computer Vision Trainee**	**iRobot Corp, Pasadena, US**
	Visual SLAM & Sensor Fusion algorithms for consumer robots.	
09/16-12/18	**R&D Engineer**	**CNEA, Bariloche, Argentina**
	Edge-based monocular SLAM system for UAVs. Robot automation of inspection systems.	
03/13-07/13	**Intern**	**KUKA Laboratories, Augsburg, Germany**
	System test and software tools for collaborative robots evaluation.	
10/12-02/13	**Reaserch Intern**	**Institut für Regelungstechnik, Braunshweig, Germany**
	Multi-body modelling of parallel robots vibratory behaviour.	
10/12-02/13	**Student assistant**	**Institut für Regelungstechnik, Braunshweig, Germany**
	PCB design and manufacturing for industrial cleaning robots.	

Teaching

Since 01/20	**Teaching Assistant**	**University of Bonn, Germany**
	Courses: Python applied to Machine Learning; MSc Project Mobile Sensing & Robotics; MSc Project Technology & precision Farming	
02/16-12/18	**Teaching Assistant**	**Instituto Balseiro, Argentina**
	Courses: Signals & Systems; Digital Electronics.	

Publications

C. Smitt, M. Halstead, P. Zimmer, T. Läbe, E. Guclu, C. Stachniss, C. McCool. "PAg-NeRF: Towards fast and efficient end-to-end panoptic 3D representations for agricultural robotics", ArXiv pre-print arXiv:2309.05339, 2023.

Y. Pan, F. Magistri, T. Läbe, E. Marks, **C. Smitt**, C. McCool, J. Behley, C. Stachniss, "Panoptic Mapping with Fruit Completion and Pose Estimation for Horticultural Robots", arXiv preprint arXiv:2303.08923, 2023

C. Smitt, M. Halstead, A. Ahmadi, C. McCool, "Explicitly Incorporating Spatial Information to Recurrent Networks for Agriculture", in IEEE Robotics and Automation Letters (RA-L), presented at IROS 2022.

M. Halstead, A. Ahmadi, **C. Smitt**, O. Schmittmann, C. McCool, "Crop Agnostic Monitoring Driven by Deep Learning", Frontiers in plant science 12, 2021.

T. Zaenker, **C. Smitt**, C. McCool, M. Bennewitz, "Viewpoint Planning for Fruit Size and Position Estimation", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021.

C. Smitt, M. Halstead, T. Zaenker, M. Bennewitz, C. McCool, "PATHoBot: A Robot for Glasshouse Crop Phenotyping and Intervention", IEEE International Conference on Robotics and Automation (ICRA), 2021.

J. Tarrio, **C. Smitt**, S. Pedre. "SE-SLAM: Semi-Dense Structured Edge-Based Monocular SLAM", ArXiv preprint arXiv:1909.03917, 2019.

C. Smitt, C. Trujillo, J. Tarrio, S. Pedre. "Generic Embedded Drivers for Robotic Tele-Manipulator Joints". Proceedings of the 16º Reunión de Trabajo en Procesamiento de la Información y Control (RPIC), 2015.

Awards & Scholarships

2022	**Best Paper Award on Agricultural Robotics**	IROS 2022, Kyoto, Japan
	C. Smitt, M. Halstead, A. Ahmadi, C. McCool. Explicitly incorporating spatial information to recurrent networks for agriculture.	
2017	**Autonomous Multicopter Challenge - 1st place**	IX Jornadas Argentinas de Robótica, Cordoba, Argentina
	J. Tarrio, **C. Smitt**, S. Pedre	
2014	**Best Student Paper**	VIII Jornadas Argentinas de Robótica, Buenos Aires, Argentina
	E. Battocchio, **C. Smitt**. Diseño de un controlador robusto para la cancelación activa de vibraciones en robots paralelo.	
2012-2013	**DAAD - ALEARG International Exchange Scholarship**	Braunschweig & Augsburg, Germany
	Engineering courses, collaboration on research projects and internship at KUKA GmbH.	

Academic Supervision

Master Thesis Supervision

Since 05/23	Bharath Santhanam. *High precision 3D reconstruction of sweet peppers leveraging RGB textures*.
Since 01/23	Fernando Blanco. *Semi-supervised panoptic segmentation for robot navigation in arable fields*.
10/22-05/23	Omar Eldahshoury. *Vision-Based Automation System to Prepare Harvested Lettuces for Packaging*.
07/17-07/18	Jimena Lopez Morillo. *Design of a robotic prosthetic hand & fabrication with 3D printing techniques*.

Master Course Project Supervision

04/22-08/22	Erik Böholand, Jannik Boos. *3D Mapping a Glasshouse Environment over time*.
10/20-03/21	Lukas Gürtle. *Phenotyping Indices Estimation from Robot Collected NIR images*.
	Philip Blömeke. *Autonomously Detecting the End of a Crop Row Using a Sensor Array*.