

Contact

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Claus Smitt 
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Ivisroot 

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

Claus G. Smitt

AI Perception Robotist

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 N° 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 **Research Intern** **Institut für Regelungstechnik, Braunschweig, Germany**
Multi-body modelling of parallel robots vibratory behaviour.
- 10/12-02/13 **Student assistant** **Institut für Regelungstechnik, Braunschweig, Germany**
PCB design and manufacturing for industrial cleaning robots.

Teaching

- Since 01/20 **Teaching Assistant** **Bonn of University, 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 16^o Reunión de Trabajo en Procesamiento de la Información y Control (RPIC), 2015.

Awards & Scholarships

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

Academic Supervision

	Master Thesis Supervision
Since 05/23	Bharath Santhanam. <i>High precision 3D reconstruction of sweet peppers leveraging RGB textures.</i>
Since 01/23	Fernando Blanco. <i>Semi-supervised panoptic segmentation for robot navigation in arable fields.</i>
10/22-05/23	Omar Eldahshoury. <i>Vision-Based Automation System to Prepare Harvested Lettuces for Packaging.</i>
07/17-07/18	Jimena Lopez Morillo. <i>Design of a robotic prosthetic hand & fabrication with 3D printing techniques.</i>
	Master Course Project Supervision
04/22-08/22	Erik Böholand, Jannik Boos. <i>3D Mapping a Glasshouse Environment over time.</i>
10/20-03/21	Lukas Gürtle. <i>Phenotyping Indices Estimation from Robot Collected NIR images.</i>
	Philip Blömeke. <i>Autonomously Detecting the End of a Crop Row Using a Sensor Array.</i>