

Varun Raj Kompella, Dr.,

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Education

- **PhD. in Computer Science** Lugano, Switzerland
IDSIA-SUPSI-USI 2010 - 2014
 - Title: Slowness Learning for Curiosity-Driven Agents.
 - Advisor: Prof. Juergen Schmidhuber.
 - Jury: Prof. Benjamin Kuipers, Prof. Srin Narayanan, Prof. Laurenz Wiskott, Prof. Stefan Wolf, Prof. Matthias Hauswirth.
- **MS in Graphics, Vision and Robotics** Grenoble, France
INRIA-INPG 2008 - 2009
 - Master's thesis ranked second in the university.
 - Thesis Title: Image-based Detection of Semi-Transparent Objects.
 - Advisor: Prof. Peter Sturm.
- **B.E. in Electronics and Communication Engineering** Bangalore, India
M.S. Ramaiah Institute of Technology 2003 - 2007

Work Experience

- **Cogitai Inc.,** Aachen, Germany
Research Scientist 2017 - current
 - Research scientist working remotely in Aachen, Germany.
- **INI, Ruhr University** Bochum, Germany
Post-Doctoral Researcher 2015 - 2017
 - Currently working on biologically plausible continual learning.
- **IDSIA-SUPSI-USI** Lugano, Switzerland
Doctoral Student 2010 - 2014
 - Developed algorithms that combine slowness learning and curiosity-driven reinforcement learning.
- **Honda Research Institute Europe GmbH** Offenbach, Germany
Research Internship 2009 - 2010
 - Worked in the area of developing biologically plausible scene-based representations for the ASIMO robot.
- **INRIA Rhone-Alpes** Grenoble, France
Graduate Researcher 2008 - 2009
 - Worked in the PERCEPTION project.
 - Completed my Masters' thesis in image-based detection of semi-transparent objects.
- **Indian Institute of Science (IISc)** Bangalore, India
Research Internship 2006 - 2008
 - Worked in the Mobile Robotics Laboratory under the guidance of Prof. Debasish Ghose

- Primarily researched in vision-based navigation algorithms for a mobile robot and also on bio-inspired swarm intelligence algorithms.

Publications

• Patents:

- V. R. Kompella and D. Ghose. “*Machine Vision Based Obstacle Avoidance System*”, Pub. No.: US 2011/0050883 A1, U.S. patents filed on the following inventions
 - Vision-based guiding cane
 - Vision-based wheelchair

• Tutorials:

- V. R. Kompella. “*Slow Feature Analysis for Curiosity Driven Agents*”, IEEE WCCI-2014, Beijing, China.

• Journals:

- V. R. Kompella, M. Luciw, M. F. Stollenga and J. Schmidhuber. “*Optimal Curiosity Driven Modular Incremental Slow Feature Analysis*”, Neural Computation Journal, 2016.
- V. R. Kompella, M. F. Stollenga, M. Luciw and J. Schmidhuber. “*Continual Curiosity-Driven Skill Acquisition from High-Dimensional Video Inputs for Humanoid Robots*”, Artificial Intelligence Journal (AIJ, Elsevier), 2015.
- M. Luciw*, V. R. Kompella*, S. Kazerounian and J. Schmidhuber. “*An intrinsic value system for developing multiple invariant representations with incremental slowness learning*”, Frontiers in Neurorobotics, Vol. 7 (9), 2013. *Joint first authors.
- V. R. Kompella, M. Luciw and J. Schmidhuber. “*Incremental Slow Feature Analysis: Adaptive Low-Complexity Slow Feature Updating from High-Dimensional Input Streams*”, Neural Computation Journal, Vol. 24 (11), pp. 2994–3024, 2012.
- V. R. Kompella and P. Sturm. “*Collective-Reward Based Approach for Detection of Semi-Transparent Objects in Image*”, Computer Vision and Image Understanding, Vol. 116 (4), pp. 484–499, 2012.

• Conferences:

- V. R. Kompella, M. Stollenga, M. Luciw and J. Schmidhuber. “*Explore to See, Learn to Perceive, Get the Actions for Free: SKILLABILITY*”, IEEE International Joint Conference on Neural Networks (IJCNN), Beijing, 2014.
- V. R. Kompella, S. Kazerounian and J. Schmidhuber. “*An Anti-Hebbian Learning Rule to Represent Drive Motivations for Reinforcement Learning*”, International Conference on the Simulation of Adaptive Behavior (SAB), Castellon, 2014.
- V. R. Kompella, M. Luciw, M. Stollenga, L. Pape and J. Schmidhuber. “*Autonomous Learning of Abstractions using Curiosity-Driven Modular Incremental Slow Feature Analysis. (Curious Dr. MISFA)*”, IEEE International Conference on Developmental and Learning and Epigenetic Robotics (ICDL-EpiRob), San Diego, 2012.
- M. Luciw, V. R. Kompella and J. Schmidhuber. “*Hierarchical Incremental Slow Feature Analysis*”, Workshop on Deep Hierarchies in Vision (DHV, Vienna), 2012.
- V. R. Kompella, L. Pape, J. Masci, M. Frank and J. Schmidhuber. “*AutoIncSFA and Vision-based Developmental Learning for Humanoid Robots*”, 11th IEEE-RAS International Conference on Humanoid Robots (Humanoids), Bled, Slovenia, 2011.
- V. R. Kompella, M. Luciw and J. Schmidhuber. “*Incremental Slow Feature Analysis*”, 22nd International Joint Conference on Artificial Intelligence (IJCAI), Barcelona, 2011.

- V. R. Kompella and P. Sturm. *"Detection and Avoidance of Semi-Transparent Obstacles using a Collective-Reward Approach"*, IEEE International Conference on Robotics and Automation (ICRA), Shanghai, 2011.
- V. R. Kompella, B.V. Sharschandra, K.N. Krishnanand, and D.Ghose. *"A Tracked Mobile Robot with Vision-based Obstacle Avoidance"*, 13th National Conference on Mechanisms and Machines (NaCoMM07), Bangalore, 2007.
- V. R. Kompella, Kiran Patil, D.V. Kaushik Kariappa, and Amit Madhav Jakati. *"A Beacon-Based Docking System for an Autonomous Mobile Robot"*, 13th National Conference on Mechanisms and Machines (NaCoMM07), Bangalore, 2007.

- **Technical Reports:**

- V. R. Kompella, and L. Wiskott. *"Intrinsically Motivated Acquisition of Modular Slow Features for Humanoids in Continuous and Non-Stationary Environments"*, ArXiv e-prints, eprint no. 1701.04663, <https://arxiv.org/abs/1701.04663>, 2017.

- **Press:**

- *"Curious Dr. MISFA injects a healthy dose of curiosity into robots"* by Katyanna Quach, The Register, http://www.theregister.co.uk/2017/01/24/curious_dr_misfa_to_treat_robots_with_a_dose_of_curiosity/, 2017.
- *"Curiosity Depends on What You Already Know"* by Zach St. George, Nautilus magazine, <http://nautil.us/issue/33/attraction/curiosity-depends-on-what-you-already-know>, 2016.

Awards

Received a patent award for the two US patents filed via Intellectual Ventures-ASIA (\$24,000) 2009

Skills

Languages: Python, C/C++, \LaTeX , Javascript and PIC Assembly

Operating Systems: Linux, UNIX, MacOS X, Windows 95/98/NT/2000/XP

Miscellaneous: Matlab, Intel OpenCV and several Internet scripting languages.

References

Available on request.