Varun Raj Kompella

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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. Srini 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

- **INI, Ruhr University**   Bochum, Germany
  Post-Doctoral Researcher   *2015 - current*
    - 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 Al, 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), Shangai, 2011.

- V. R. Kompella, B.V. Sharschchandra, 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

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