Rama Krishna Kandukuri

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🌐 [Personal Website](#) [in/krkprasad](#) [github.com/prasadkrkp](#)

Education

Masters in Mechatronics Engineering *University of Siegen* Siegen, Germany 2017-2020
Robotics, Control, Optimization, Computer Vision and Machine Learning. (**Master's thesis: 1.0**)

Bachelors in Mechanical Engineering *National Institute of Technology Rourkela* Rourkela, India 2012-2016
Kinematics, Dynamics, Design, Thermodynamics, Mechatronics and Optimization.

Research and Work Experience

Robot Software Engineer - Simulation, *Magazino* Munich, Germany 09/2024 -
Development and maintenance of simulation platforms for robots in **Unity** and **Gazebo** with ROS integration.

Robot Software Engineer, *Polybot* Tübingen, Germany 01/2024 - 04/2024
Training and deploying **diffusion-based generative policies** and real-time, **distributed multi-object tracking** algorithms for farming tasks, and benchmarks on the Spot mini robot.

Researcher, *Embodied Vision Group, MPI for Intelligent Systems* Tübingen, Germany 06/2020 - 12/2023
Developed and published novel computer vision methods for **3D rigid body tracking** from RGB-D video data, incorporating physically plausible modeling of rigid body dynamics with an accompanying video dataset with motion capture ground truth and physics annotations.
Research on deep learning techniques for **6D pose estimation** of rigid objects from RGB images, learning-based **planning and control** through contact/frictional constraints using **learned physics** models and **differentiable rendering** for unsupervised learning of scene physics from images.

Research Intern, *Embodied Vision Group, MPI for Intelligent Systems* Tübingen, Germany 07/2019 - 05/2020
Research on supervised, self-supervised learning methods for identifying physical parameters from videos in 2D using **differentiable physics** and spatial transformer networks. Developed controllers for the Franka arm, allowing it to seamlessly transition between trajectories when a new goal is set mid-execution to ensure real-time safety and adherence to joint state limits.

Skills

- **6 years** of professional coding experience in **Python** and **4 years** of training deep neural networks (**object detection, segmentation, transformers, diffusion models**) in **PyTorch**.
- **5 years** of **research experience** and knowledge of state of the art literature in **learning physics from videos**, physics simulations, object detection and tracking, learning-based planning and control.
- **4 years** of coding experience in **C++**(**physics simulations, sensor fusion, manipulation and perception**).
- Experienced in developing with **CUDA** (**custom kernels** for **differentiable physics** operations).
- Experienced in developing robotic software using **ROS/ROS2** for **manipulation, control, detection and motion generation**.

Publications

- Rama Kandukuri, Michael Strecke, Joerg Stueckler, [Physics-Based Rigid Object Tracking and Friction Filtering from RGB-D Videos](#), 3DV 2024.
- Rama Kandukuri, Jan Achterhold, Michael Moeller, Joerg Stueckler, [Learning to Identify Physical Parameters from video Using Differentiable Physics](#), GCPR, 2020 (**oral, honourable mention**), IJCV 2021.