Shreyas Hampali Shivakumar

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Areas of interest	Computer Vision, Machine Learning

Work Experience

PhD Researcher   **Sep 2018 − Present**
Computer Vision for Augmented Reality Lab,
TU Graz, Austria
Advisor: Prof. Vincent Lepetit

- My research is focused on understanding the scene in front of the camera in 3D from a set of RGB and/or depth measurements with minimum supervision. More specifically, I try to estimate the shape and pose of the elements in the scene from one or more images with as little training data as possible.
- My research is sponsored by Facebook Reality Labs, where I explore exciting problems related to hand-object interaction

Senior Lead Engineer   **Jun 2015 − Jul 2018**
Qualcomm Research India, Bangalore

- Development of image processing and optimization algorithms for display and camera engine in Qualcomm Snapdragon chip sets.

Graphics Design Engineer   **Jul 2012 − Jul 2015**
Visual and Parallel Computing Group,
Intel India, Bangalore

- Video processing and video encoder/decoder algorithm optimization and implementation for increased parallelism and optimum use of hardware and GPU resources.

Product Contributions

- Designed and shipped the directional image upscaling hardware module for display and camera engine in Qualcomm Snapdragon chipsets.
- Developed algorithms for automatic tuning of multiple modules in camera hardware pipeline to meet desired texture/noise trade-offs in the processed image. The full-fledged software used by several customers enables automatic camera pipeline tuning.
- Implemented and shipped HEVC-10 bit GPU accelerated video decoder and HEVC-8 bit hardware accelerated video encoder on Intel 5th gen processors.

Education

Master of Engineering (Signal processing)   **Aug 2010 − Jul 2012**
Medical Intelligence and Language Engineering Lab,
Department of Electrical Communication Engineering,
Indian Institute of Science, Bangalore, India.

- Relevant Coursework : Matrix theory, Random processes, Linear and non-linear optimization, Digital signal compression, Time-frequency analysis, Spectrum analysis, Pattern recognition and neural networks, Detection and estimation theory
- CGPA : 6.5/8.0
- M.E. Thesis : Non-negative Independent Component Analysis motivated Monaural Sound Source Separation.
  Thesis : https://goo.gl/EiPOHT   *Slides* : https://goo.gl/rtiGoW
- Adviser : Prof. A. G. Ramakrishnan

Bachelor of Technology   **Aug 2006 – May 2010**
Department of Electrical and Electronics Engineering,
National Institute of Technology - Karnataka (NITK), Surathkal, India

- Specialization : Electrical and Electronics Engineering
- CGPA : 8.42/10.0
- Major project : Harmonic Analysis of Supply Currents in VFD fed Induction Motors

Publications

- **Shreyas Hampali**, Sayan Deb Sarkar, Mahdi Rad, Vincent Lepetit. HandsFormer: Keypoint Transformer for Monocular 3D Pose Estimation of Hands and Object in Interaction. ArXiv, abs/2104.14639, 2021

- **Shreyas Hampali***, Sinisa Stekovic*, Sayan Deb Sarkar, Chetan S Kumar, Friedrich Fraundorfer, Vincent Lepetit. Monte Carlo Scene Search for 3D Scene Understanding. In *The IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021   *(First two authors contributed equally)*

- **Shreyas Hampali**, Mahdi Rad, Markus Oberweger, Vincent Lepetit. HOnnotate: A method for 3D Annotation of Hand and Object Poses. In *The IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020

- Sinisa Stekovic, **Shreyas Hampali**, Mahdi Rad, Sayan Deb Sarkar, Vincent Lepetit. General 3D Room Layout from a Single View by Render-and-Compare. In *Proc. European Conference on Computer Vision (ECCV)*, 2020

- Anil Armagan, Guillermo Garcia-Hernando, Seungryul Baek, **Shreyas Hampali**, ..., Vincent Lepetit, Tae-Kyun Kim. Measuring Generalisation to Unseen Viewpoints, Articulations, Shapes and Objects for 3D Hand Pose Estimation under Hand-Object Interaction. In *Proc. European Conference on Computer Vision (ECCV)*, 2020

Patents

- **Shreyas Hampali**, Vincent Lepetit, Clemens Arth, "Keypoint-based Sampling for Pose Estimation", U.S Patent filed, Application no. 63/162,305

- **Shreyas Hampali**, Sinisa Stekovic, Friedrich Fraundorfer, Vincent Lepetit, "Layout and Object Estimation for Scenes in Images", U.S Patent filed, Application no. 63/113,722

- **Shreyas Hampali**, "Video Coding Including a Stage-Interdependent Multi-Stage Butterfly Integer Transform", U.S. Patent 20160021369, published Jan 21, 2016.

- **Shreyas Hampali**., Ajit Rao, Yogesh Gupta and Conrad Harrison, "Artifact detection in a contrast enhanced output image", U.S. Patent filed, Application no. 15/702,394

- **Shreyas Hampali**, Pawan Baheti and Naveen Srinivasamurthy, "Systems and methods for non-recursive image signal processor tuning using a reference image", India Patent filed, Application no. 201841003400

- Shilpi Sahi, Pawan Baheti, Aarrushi Shandilya, **Shreyas Hampali**, Naveen Srinivasamurthy and Yogesh Gupta, "Systems and methods for assisted image signal processor tuning", India Patent filed, Application no. 201841003395

- Pawan Baheti, Shilpi Sahu, Naveen Srinivasamurthy, Yogesh Gupta, Uday Kiran Pudipeddi, **Shreyas Hampali**, "Systems and methods for assisted image signal processor tuning using a reference image", India patent filed, Application no. 201841003373

- **Shreyas Hampali** and Dowray Raghvendra Rao, "Remote Image based Measurement System", India Patent 4785/CHE/2012, filed November 2012.

Scholastic Honors	• Graduate Aptitude Test in Engineering (Mar 2010) : Ranked 6th in the country in electrical engineering stream
	• All India Engineering Entrance Examination (Mar 2006) : Ranked 155 in the state
Computer Skills	Languages : OpenCV, C, C++, Python, Matlab, Tensorflow Typography : LaTeX
Nationality	Indian
Languages	English, Kannada, Hindi