

# Anurag Ranjan | Curriculum Vitae

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## Highlights

Research focus on Deep Learning for videos.

Skilled and experienced in the field of Computer Vision and Machine Learning.

Awarded IEEE Extreme Programming Contest 2011 - India Rank 2.

Recipient of Prime Minister's Letter for academic appreciation as a part of MITACS program, Canada.

## Technical Skills

**Languages:** Lua, Python, MATLAB, C, C++, Cuda.

**Software:** Tensorflow, Torch, Theano, Point Cloud Libs, OpenCV, ROS, Maya, Hadoop, OpenNI, OpenGL.

**Web:** HTML, CSS, SQL, JS, jQuery, AJAX, Django, LAMP.

**Hardware:** FPGA Development, VLSI Design, ASICS and Microcontrollers, SPICE, Electric.

## Education

**Max Planck Institute for Intelligent Systems**

*Doctor of Philosophy, Perceiving Systems Department*

**Tübingen, Germany**

*Jan 2016– Present*

**The University of British Columbia**

*Masters of Science, Department of Computer Science, GPA – 89.5/100*

**Vancouver, BC**

*Sep 2013– Sep 2015*

**National Institute of Technology, Karnataka**

*Bachelor of Technology, Department of Electronics and Communication Engineering*

*GPA – 9.28/10*

**Surathkal, India**

*July 2009– May 2013*

## Experience

### Work

**Max Planck Institute for Intelligent Systems**

*Doktorand, Perceiving Systems Department*

**Tübingen, Germany**

*Jan 2016- Present*

- Working on deep learning methods for dense estimation problems such as Optical Flow.

**The University of British Columbia**

*Research Assistant, Sensorimotor Systems Lab, Department of Computer Science*

**Vancouver, BC**

*July 2013- Sep 2015*

- Worked on Computer Vision and Machine Learning methods for face capture and simulation.
- Achieved the current benchmark on tracking deformations around the face using dense optical flow estimation.
- Obtained realistic animation of faces using Maya and MATLAB.
- Submitted a poster on the current work and results to ACM/SIGGRAPH SCA 2015.

**National Institute of Technology, Karnataka**

*Dissertation, Department of Electronics and Communication Engineering*

**Surathkal, India**

*2012-13*

- Worked on *Compressive Sensing* of Hyperspectral images and MRI scans under *Prof. Sumam David*.
- Our algorithm achieved higher compression rates for both satellite imaging and MRI scanning in a generic framework.

**École Polytechnique de Montréal**

*Globalink Research Intern, Department of Transportation Engineering*

**Montréal, QC**

*May–July 2012*

- Developed a software for estimating moving object volume using video data from traffic cameras.
- Estimated 3D shapes of moving objects such as traffic and pedestrians using homography parameters of fixed traffic cameras.
- Developed the software in Python using OpenCV libraries and released the source on Bitbucket.
- Source Available here: [https://bitbucket.org/anurag\\_ranj/3d-volume-estimation](https://bitbucket.org/anurag_ranj/3d-volume-estimation)

**India Innovation Labs**  
*Summer Research Intern*

**Bangalore, India**  
*May–June 2011*

- Developed a software for fast 3D object recognition and pose estimation with object tracking.
- Implemented the object recognition system using Point Cloud Library and OpenNI Camera (Kinect).
- Achieved better recognition which was robust to light changes by using depth data instead of color.
- Published the work and results in IEEE conference on RACSS.

**India Innovation Labs**  
*Summer Research Intern*

**Bangalore, India**  
*June–July 2011*

- Worked on *Collective Intelligence Platform* for building a knowledge generating engine.
- The engine resides at a central location to which external agents may be latched on to.
- The aim of this engine was to generate knowledge, store it appropriately and make it available to the agents upon request.
- Implemented the request-response system using Apache Hadoop and ROS connect engine to external agents.

**Therataxis**

**Bangalore, India**  
*2010-11*

*Research Intern, Supervisor: Prof. Tim Poston*

- Made a hardware prototype of the first 3DoF mouse from scratch using the same sensors used in traditional optical mouse.
- The mouse estimated an extra degree of motion(DoF), rotation, as opposed to traditional 2DoF mouse.
- The mouse used same sensor as traditional 2DoF mouse but leveraged the image data obtained by them to detect rotation.

**Teaching**

*Teaching Assistant, Intermediate Algorithm Design and Analysis: CPSC 320, UBC* 2015

*Teaching Assistant, Computer Vision : CPSC 425, UBC* 2014

*Tutor, Computer Programming Lab : CO111, National Institute of Technology Karnataka* 2013

**Positions**

**Mitacs Globalink Program**

*Ambassador* 2013

Assisted prospective and accepted students of Mitacs Globalink Program for a 3 month summer internship in Canadian Universities.

**Electrical and Electronics Committee, Engineer, Annual Technical Fest, NITK**

*Joint Convener* 2012–2013

Organized an image processing robotic event, *Automata*; and an Online Programming Contest, *Simplicity*. Worked on coding the evaluator for Simplicity on MATLAB Distributive Computing Server and LAMP.

**Robotics Club, NITK**

*Programming Coordinator* 2012–2013

Coordinated and mentored various robotic software projects taken up by the club.

**Papers**

*Neog D., Cardoso J., Ranjan A., Pai D., Interactive gaze driven animation of the eye region. In International Conference on Web3D Technology, ACM, 2016*

*Neog D., Ranjan A., Cardoso J., Pai D., Gaze Driven Animation of Eyes. In Symposium of Computer Animation, 2015*

*Bongale, P., Ranjan, A., & Anand, S., Implementation of 3D object recognition and tracking. In Recent Advances in Computing and Software Systems (RACSS), 2012 International Conference on (pp. 77-79). IEEE.*

**Awards**

*Mitacs Globalink Graduate Fellowship* 2013

*Recipient of Prime Minister's Letter for academic appreciation, MITACS Globalink Program, Canada.* 2012

*IBM Web Technical Contest Award: Interpretation of Behaviour of Autistic Individuals using Gesture Recognition and Tracking with Depth Sensor camera and Point Cloud Libraries.* 2011

**Open Source Projects**

**Parallel Stochastic Gradient Methods**

[https://bitbucket.org/anurag\\_ranj/parallel-stochastic-gradient-methods](https://bitbucket.org/anurag_ranj/parallel-stochastic-gradient-methods) 2014

- Parallelization of Stochastic Gradient Methods on GPUs for faster optimization in Machine Learning applications.
- Achieved linear computation speed ups w.r.t number of cores in sparse systems using CUDA and Mex(MATLAB).