

# KUNAL CHELANI

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## SUMMARY

Bachelor's in Computer Science from BITS Hyderabad. Master's in Computer Science from IISc Bengaluru, with a focus on geometric Computer Vision and Machine Learning. Pursuing PhD in Computer Vision at Chalmers University of Technology.

## EDUCATION

Indian Institute of Science  
M.Tech Computer Science 2019  
CGPA - 9.0/10

BITS - Pilani, Hyderabad Campus  
BE(Hons.) Computer Science 2015  
CGPA - 8.3/10

Seedling Modern High School  
Senior Secondary Examination, CBSE 2011  
93%

Seedling Modern High School  
Secondary Examination, CBSE 2009  
93.6%

## PROJECTS

Master's Thesis - Robust Indoor Depth SLAM - Analysis and Improvements  
June 2018 to June 2019

- Improvements in recent registration frameworks are shown using normal alignment constraints
- A method is suggested for harnessing planar structures in indoor environments for added robustness
- Usage of the motion averaging framework is suggested for drift reduction, both locally and globally

Automated Floor-plan generation using depth cameras  
June 2018 to Aug. 2018

- Inexpensive depth cameras to recover accurate 3D reconstructions of indoor enclosures.
- Filtering and slicing to recover rectilinear representations of rooms with extremely accurate measurements.
- Published in the Proceedings of the 11th ICVGIP-2018.

Symmetry detection on mesh surfaces using contour clustering  
Oct. 2017 to Nov. 2017

- Leveraged curvature based scalar field to obtain symmetric iso-contours on symmetric objects.
- Obtained pairwise difference between the contours obtained, as the minimum RMSE in point cloud overlapping. (Kabsch Algorithm)
- Clustered contours to obtain symmetric regions on mesh surface.

Mining Product Attributes from online product reviews  
July 2015 to Nov. 2015

- Extracted key words from the product reviews submitted by customers on Walmart.com
- Employed TF-IDF weight based selection algorithm to prune significant characteristics of each item
- Review analysis to identify significant features of items opened up new areas of market analysis

Click-through rate prediction  
Jan. 2015 to Apr. 2015

- Comparison of different classification techniques on the basis of run-time as well as accuracy.
- Designed an algorithm with 86% maximum accuracy predicting clicks under specified conditions.

Optimization of Differential Evolution approximation algorithm  
Aug. 2013 to Dec. 2013

- Enhanced the accuracy of the algorithm by refining the selection criterion for initial solution population
- Integrated research with real-world implementation in a minimization problem pertaining to water distribution in Pune, India.
- Achieved the approximate solution to this problem in less than 2 minutes.

## EMPLOYMENT

Robotics Research Centre - IIIT Hyderabad  
Research Intern · Feb. 2017 to July 2017 · Hyderabad

- Cross Sensor Calibration - Used a combination of 2D re-projection error along with a 3D correspondence euclidean error to produce sub centimetre mean accuracy for calibrating a LiDar with a mono-camera. Obtained this results with a no-cost experimental setup. Link to the work: [arXiv:1705.09785](https://arxiv.org/abs/1705.09785)

Walmart technology  
Software Engineer II · Aug. 2015 to Oct. 2016 · Bangalore

Hadoop-to-Cassandra:

- Developed a generic map-reduce based application to load data from HDFS to Cassandra database securely, supporting all data formats of both the warehouses.
- Gained expertise over shell scripting as part of automating and parameterising the process of fetching, computing and transferring data.

Dynamic Dashboards on huge data:

- As part of the member engagement platform, the analysis of campaigns runs on data ranging upto many terabytes. While preparing the analysis based on a set of filters, joining tables on-the-go or storing values for all possible combinations are not viable options.
- By adding many functionalities to the core of Apache Zeppelin's spark-based querying engine, I developed a web-service based platform to effectively query large de-normalised flat tables and hence build dynamic dashboards within seconds.
- The generic nature of web-service based platform allowed teams from many different departments to use our solution without any hassle

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## EMPLOYMENT

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### Walmart Technology

Data Science Intern · July 2014 to Dec. 2014 · Bangalore

Sales Pattern based correction of on-hand quantity

- Used sales pattern to correct the quantity of products on-shelf and in the back room, in-turn detecting no stock and allowing a bigger window for stores to pre-order from warehouses.
- Massively improved the efficiency of this program as well, bringing down the run-time from several hours to less than 2 minutes.

Black Friday sales prediction

Implemented predictive algorithms like decision-tree learning and linear regression over map-reduce framework in Java to predict the sales at Walmart stores during the Black Friday week.

### Logicare Embedded Systems

Intern · May 2013 to July 2013, May 2013 to July 2013 · Pune

- Designed and developed backend for an automated sun tracker to be used for natural lighting systems for indoor environments.

## SKILLS

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**PROGRAMMING LANGUAGES:** Java, C, C++, R, Python, Bash, MATLAB

**FRAMEWORKS AND LIBRARIES:** Hadoop, Web Services Development, Tensorflow, Point Cloud Library, ROS (Robot Operating System), Open3D

**RELEVANT COUREWORK:** Machine Learning, Optimization, Computer Graphics, Linear Algebra, Probability & Statistics, Design and Analysis of Algorithms, Spectral Algorithms, Deep Learning for Computer Vision, Geometric Computer Vision, Reinforcement Learning

## AWARDS

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All India Rank - 4

Feb. 2017

GATE 2017 (Graduate Aptitude Test In Engineering)

Walmart Technology · SPOT Award

May 2016

An award for outstanding problem solving abilities and efforts towards development of the product.

Walmart Technology · 1st Prize , Datathon 2015

Oct. 2014

Datathon is the annual company wide event at Walmart with more than 500 entries in the first round.

My team bagged the first place for drastically improving the efficiency of the Sales-pattern based shelf quantity correction algorithm

The project had \$2.2 million worth estimated savings in the first month

Reserve Bank of India · RBI Silver jubilee scholarship award

2011

RBI awards a 4 year scholarship to students with extraordinary performance in high-school.

## ACTIVITIES

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Ultimate Frisbee · Captain

Current

6th position across all club teams in India at the first Indian National Championships in Ultimate Frisbee. (94 participating teams)

Basketball · Captain, BITS - Pilani, Hyderabad Campus

Gold medal in inter-college national sports fest, Arena 2012, 2013

Centre for Entrepreneurial Leadership · Lead - Ground Reality

- Ground Reality is the annual B-Plan competition of CEL at BITS Pilani Hyderabad Campus. Teams from across the nation participate to fight for a chance to pitch their ideas to Venture Capitalists in the final round.
- I led the sponsorship, logistics and the publicity teams during the 6 month long event

## VOLUNTEERING

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TEDx BITSHyderabadCore Member

BITS Pilani Hyderabad Campus

Assisted the logistics division, responsible for venue design and hospitality

## REFERENCES

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Prof. Chiranjib Bhattacharyya, chiru@iisc.ac.in

Department of Computer Science and Automation - Indian Institute of Science

Prof. Venu Madhav Govindu, venug@iisc.ac.in

Department of Electrical Engineering - Indian Institute of Science

Mr. Oonni Nair, oonni.krishnan@walmart.com

Walmartlabs Bangalore