

# REVANT KUMAR

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## EDUCATION

**Georgia Institute of Technology • USA**

*Master of Science in Computer Science*

(August 2014 – December 2015 (Expected))

**Selected Coursework:** Machine Learning • Data and Visual Analytics • Algorithms • Social Computing

**Indian Institute of Technology Guwahati • India**

*Bachelor of Technology in Mathematics and Computing* • GPA: 3.9/4.0

(July 2010 – May 2014)

**Selected Coursework:** Introduction to Computing • Data Structures • Data Structures Lab • Design and Analysis of Algorithms • Probability Theory and Random Processes • Operating Systems • Databases • Scientific Computing

## WORK/RESEARCH EXPERIENCE

**Japan Advanced Institute of Science and Technology • Japan**

*Research Assistant*

(May – July 2012)

- Developed a Small Space Algorithm for Removing Small Connected Components from a Binary Image with Professor Tetsuo Asano.
- Proposed a new algorithm for computing the size-threshold binary image in  $O(n \log n)$  time using only  $O(\sqrt{n})$  work space.

**Institute of Statistical Mathematics • Japan**

*Research Assistant*

(May – July 2013)

- Worked on Density Estimation in Infinite Dimensional Exponential Families with Professor Kenji Fukumizu.
- Reviewed the Mathematical Equations for the Journal Paper and De-bugged the Matlab Code which was later used for simulation.

## HACKATHON

**eBay Discovery • HackGT**

(September 19 – 21, 2014)

- Used eBay's Finding API and Shopping API to extract details about sellers and items searched by the buyers.
- Wrote Python scripts to parse the data obtained in JSON format which was later used by the UI Team.
- Used D3.js to make visualizations for Price Trends Analysis of items returned by the keyword search.

## PROJECTS

**SMS Spam Detection • Georgia Institute of Technology**

(October 2014 – Present)

- Built binary classifiers to distinguish between legitimate and spam SMSes based on their text features in Python.
- Implemented classifiers using Naive Bayes with Laplace Smoothing and Support Vector Machine (SVM) with Linear Kernel.
- Achieved mean accuracy of 98.79% for Naive Bayes Classifier and 97.68% for SVM Classifier.

**Decision Tree • Georgia Institute of Technology**

(November 2014 – Present)

- Implemented a Decision Tree using ID3 Heuristic for the given salary dataset in Python.
- Applied 10-fold cross validation to obtain the mean accuracy of 85.2%.

**Topic Modeling on Yelp Reviews • Georgia Institute of Technology**

(October 2014 – Present)

- Applied Latent Dirichlet Allocation (LDA) to Yelp Reviews to extract specific topics from them.
- Predicted ratings of extracted topics for each review by applying Multi-Aspect Sentiment Analysis, instead of overall rating of reviews.

**Recommendation System • Georgia Institute of Technology**

(October – November 2014)

- Implemented a Recommender System using Low-Rank Matrix Factorization and Gradient Descent in Matlab.
- Achieved Root Mean Square Error (RMSE) of 0.93 on the test data-set.

**Image Compression • Georgia Institute of Technology**

(September – October 2014)

- Given a RGB bitmap image file, clustered the pixels using algorithms – K-means & K-medoids in Matlab.
- In K-medoids clustering, Manhattan Distance and Partitioning Around Medoids (PAM) algorithm were used.

**Collecting and Visualizing Last.fm Data • Georgia Institute of Technology**

(August – September 2014)

- Wrote Python Scripts to collect and clean the data about similar music tracks using the Last.fm API.
- Used the tool Gephi to visualize the data as an undirected graph.

**Building a Search Engine • Udacity**

(June – July 2014)

- Built a search engine using Python.
- Implemented key search engine components including a Crawler, an Index and a Page Rank Algorithm.

**Machine Translation System using Translation Memory • Indian Institute of Technology Guwahati**

(January – March 2014)

- Implemented a Machine Translation System using Translation Memory.
- Found close matches from Translation Memory using Edit-Based Distance and worked on Target-Language Edit Hints.

## SKILLS

- Programming Languages: C, C++, Python
- Familiarity with Matlab, SQLite, D3.js, Gephi, Tableau, HTML, Git, L<sup>A</sup>T<sub>E</sub>X, Octave, Weka
- Familiarity with Linux, Mac OS X, Windows
- Natural Languages: English, Hindi, Spanish (Current Level 7 on Duolingo), Japanese (Basic)

## PUBLICATION

- Journal Publication: Tetsuo Asano, Revant Kumar: A Small-Space Algorithm for Removing Small Connected Components from a Binary Image. IEICE Transactions, Vol. E96-A, No. 6, pp. 1044-1050 (June 2013)

## HONORS AND AWARDS

- Erdős Number: 3; Path: Revant Kumar → Tetsuo Asano → Boris Aronov / Frances F. Yao → Paul Erdős