Revant Kumar

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Education

Georgia Institute of Technology • USA
Master of Science in Computer Science • GPA: 3.75/4.00 (August 2014 – December 2015 (Expected))

Selected Coursework: Machine Learning • Data and Visual Analytics • Algorithms • Social Computing • Deep Learning for Perception* • Advanced Internet Computing* • Web Search & Text Mining* (* – Current Courses)

Indian Institute of Technology Guwahati • India
Bachelor of Technology in Mathematics and Computing • GPA: 8.31/10.00 (July 2010 – May 2014)

Work/Research Experience

Information Interfaces Research Group, Georgia Tech • USA
Graduate Research Assistant under Professor John Stasko (January 2015 – Present)

- Developing a web-based application using Javascript to enable non-programmers create visualizations to analyze various data-sets.

Japan Advanced Institute of Science and Technology • Japan
Research Assistant under Professor Tetsuo Asano (May – July 2012)

- Developed a Small Space Algorithm for Removing Small Connected Components from a Binary Image.
- 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 under Professor Kenji Fukumizu (May – July 2013)

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

Projects

Multifaceted Collaborative Filtering Model • Georgia Institute of Technology (January 2015 – Present)

- Wrote python scripts to integrate baseline, item-based neighborhood and SVD++ models in a single combined model.
- Applied 10-fold cross validation to choose the rank (number of latent factors), learning rate and regularization parameter.
- Achieved Root Mean Square Error (RMSE) of 0.901 on the test data-set (using MovieLens Data-set).

Modeling Aspects, Ratings & Sentiments for Movie Recommender • Georgia Institute of Technology (January 2015 – Present)

- Wrote python scripts to jointly model the Aspects, Ratings and Sentiments for Movie Recommendation using data from IMDb.
- Achieved Mean Square Error of 4.97 on the held-out test data-set as measured by McNemar's test.

SMS Spam Detection • Georgia Institute of Technology (October – December 2014)

- 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 – December 2014)

- 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 – December 2014)

- 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.

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.

Skills

- Programming Languages: C, C++, Python
- Familiarity with Matlab, SQLite, D3.js, Gephi, Tableau, HTML, Javascript, CSS, Git, LaTeX, Octave, Weka, Hadoop, Pig
- Familiarity with Linux, Mac OS X, Windows
- Natural Languages: English, Hindi, Spanish (Current Level 7 on Duolingo), Japanese (Basic)

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.

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

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