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 • 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.
- From an algorithmic point of view, the problem can be solved in $O(n)$ time and $O(n)$ work space.
- 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.

Image Compression • Georgia Institute of Technology   (October 2014 – Present)
- 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.
- Created the final compressed image by coloring each cluster with the representative color of it's centroid.

Collecting and Visualizing Last.fm Data • Georgia Institute of Technology   (August – September 2014)
- Used the Last.fm API to download data about music tracks, and 100 similar tracks for each track.
- Wrote Python Scripts to create and clean the data files using the downloaded Last.fm data.
- 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.
- Worked on Target-Language Edit Hints.

SKILLS

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

PUBLICATIONS/PRESENTATIONS

- 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)
- Mention in Acknowledgements: Bharath Sriperumbudur, Kenji Fukumizu, Arthur Gretton, Aapo Hyvärinen: Density Estimation in Infinite Dimensional Exponential Families. arXiv:1312.3516 [math.ST] (December 2013)
- Presentation: Revant Kumar and Ulrich Rüde: "Multigrid Methods", 11th Indo-German Winter Academy, December 11-17, 2012.

HONORS AND AWARDS

- Erdős Number: 3; Path: Revant Kumar → Tetsuo Asano → Boris Aronov / Frances F. Yao → Paul Erdős
- Best Student Technical Presentation Award at Techniche, IIT Guwahati in September 2012
- Completed Youth Empowerment and Skills (YES+) Course offered by The Art of Living