Aman Madaan

https://madaan.github.io, +1-650-430-7737

EDUCATION

Indian Institute of Technology Bombay, Mumbai JULY 2013 - JULY 2015
M.Tech. *in Computer Science and Engineering (CPI: 10.0/10.0, Department Rank 1)*
Thesis: Numerical Relation Extraction with Minimal Supervision

Guru Gobind Singh Indraprastha University, Delhi JULY 2009 - JUNE 2013
B.Tech. *in Computer Science and Engineering (Percentage : 87.4, , Department Rank 1)*
Thesis: Distributed Compilation as a Service

INDUSTRY EXPERIENCE

- **Oracle, Redwood Shores, CA** *(December 2017 - Present)*
  *(**Principal Member of Technical Staff**)*
  - **Analytics Cloud Platform 360°** Responsible for design and development of an analytics platform that extracts usage insights for Oracle BI applications. The platform is fed data from multifarious sources, including query server logs, support request tickets dataset and bugs database. The insights produced include metrics to quantify customer sentiment, customer engagement levels, discover recurring paths in the bug/support request flow, conversation analysis and detection and analysis of *outlier* queries (*for example, those with runtime > 99^{th} percentile of the run times in the last one week).*
- **Visa, Foster City, CA** *(August 2015 - December 2017)*
  *(**Senior Decision Analytics Architect**)*
  - **Deep Learning for Predicting Card Level Attributes** Led one of the first efforts across Visa Engineering teams to develop a Deep Learning stack that scales to Visa Data. The solution was used to train credit card attribute prediction models and run inference for each of the ~ 500 million Visa cards.
  - **Visa Card Upgrade Model** Led the development of a card upgrade model to predict cardholders that should be offered a level up to the *Visa Signature* card type. Using novel feature engineering and the ability to work at individual transaction level features, the model was able to **beat existing TreeNet based solution** in terms of both speed and accuracy.
  - **SpendBot** Designed and developed a chatbot that allows users to ask questions in natural language about their spend habits. For example, *"how much am I spending on meals?"*.
  - **Customer Segmentation Platform** Responsible for design and development of predictive models and big data pipeline for a data segmentation platform. The models and aggregating pipelines processed transaction data from half a billion Visa Card holders for over 10000 merchants every day. The solution helped in scaling the business **100x in terms of revenue**.
  - **Audience Delivery Service** Designed and developed a multi-tenant Spark server built on top of novel scoring algorithms that performs data segmentation and scoring at scale and enables the delivery of hundreds of audience segments a day.

RESEARCH EXPERIENCE

- **Lookalike Modeling at Scale** *(Jan 2017 - Nov 2017)*
  *(**Visa Inc.**, Project Lead, done in collaboration with Anant Singhania with guidance from Jagdish Chand)*
  - ***Objective:*** Given a set of N cardholders, find another set of N cardholders who *spend like* the given set. The fairly abstract problem statement helped in broadening the scope of applications from the initiative.
  - Solution based on fine-grained spend and card attributes was extremely effective and was able to beat the existing internal solutions for relevant problems. **The work was accepted at iCube 2017, a highly competitive Visa internal technical conference open to Visa employees across the world.**
- **Numerical Relation Extraction with Minimal Supervision** *(May 2014 - July 2015)*
  *(**M.Tech Thesis Project**, Guided by Prof. Sunita Sarawagi, Prof. Ganesh Ramakrishnan and Prof. Mausam)*
  - ***Objective:*** To harness the Web for numerical relations, where relations are 3-tuples linking an entity to a number, like Co2 emission of India, the average age of a Camel etc.
  - Designed and developed a rule-based system, NumberRule and a probabilistic graphical model Numbertron that give state of the art result for the task. **The work was accepted at AAAI 2016, `http://www.aaai.org/ocs/index.php/AAAI/AAAI16/paper/view/12486`** .

- **Distributional Statistics of Entities on the Web** *(Jan 2014 - May 2014)*
  (R & D Project, Guided by Prof. Sunita Sarawagi)
  - ***Objective:*** To estimate the ratio of Entities (People, Organization, etc.) in a given text corpus using maximum mean discrepancy. In the process, I did a survey of the literature and state of the art tools and techniques for solving the problem of Named Entity Disambiguation.
  - **Report:** `https://arxiv.org/abs/1605.04359`
  - **Presentation:** `https://goo.gl/c5F2oh`.
- **Distributed Compilation as a Service** *(July 2012 - April 2013)*
  (B.Tech. Project, Guided by of Prof. Sunil K. Singh)
  - ***Objective:*** To provide the idle CPU time of machines in a computer lab as a distributed compilation service
  - ***Approach:*** Developed a client-server system that keeps track of free systems (helpers) and divides the work fairly among the helpers. Developed an intuitive interface so that the system can be used oblivious of the complexities of the back-end. **Work published at `http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=6637374`** .

PUBLICATIONS

- Aman Madaan, Jagdish Chand, and Anant Singhania. Lookalike modeling at scale. In *iCube 2017 Visa US Inc.*, pages 1352–1357. Visa Inc, 2017
- Aman Madaan, Ashish Mittal, Ganesh Ramakrishnan, and Sunita Sarawagi. Numerical relation extraction with minimal supervision. In *Thirtieth AAAI Conference on Artificial Intelligence*. AAAI, 2016
- Sunil Kr Singh, Aman Madaan, Ankur Aggarwal, and Ankur Dewan. Design and implementation of a high performance computing system using distributed compilation. In *International Conference on Advances in Computing, Communications and Informatics (ICACCI), 2013*, pages 1352–1357. IEEE, 2013

AWARDS & ACHIEVEMENTS

- **Above and Beyond Gold Award** by Visa Inc., **Awarded four times** for work done on Segmentation Platform, SpendBot and for leading initiatives that led to successful demos and technical talks, Jan 2016, Feb 2017, July 2017, September 2017.
- **Go Beyond Award** by Visa Inc., **Awarded twice** for extraordinary contributions to the business and for leading the process for hiring Data Scientists for a new team, July 2017, October 2017.
- **Promoted within 11 months** of starting at Visa to Senior Decision Analytics Architect *(the average time for promotion to the level is **4 years**)*.
- **TA Excellence Award** by Dept. of C.S.E., IIT Bombay, for work done while assisting Prof. Saketha Nath in **CS 725 (Foundations of Machine Learning)**, October 2015.
- **Ajit Shelat Award**, *Given to a deserving M. Tech. student from the EE Dept and CSE Dept combined with the highest CPI*, 53^{rd} Convocation, IIT Bombay, August 2015.
- **Institute Silver Medal**, 53^{rd} Convocation, IIT Bombay, August 2015.
- **Department Rank 1** among 120 students in M.Tech(CSE) 2015 batch, IIT Bombay.
- **Winner, AngelHack Mumbai**, June 2014 (**out of 38 teams**). Selected for the finals and **accepted at HACKcelerator** program with office space, mentorship and $5000 worth of Amazon AWS credits (*declined*).
- **Department Rank 1** among 64 students in B.Tech(CSE) 2013 batch, BVCOE, New Delhi.
- **All India Rank 9** in Graduate Aptitude Test in Engineering (GATE) 2013 out of **224,160 candidates**.
- **TCS Best Student award 2013**, Presented to **100 students across India**.
- **Best outgoing Student Award, 2013 batch** by Bharati Vidyapeeth's College of Engineering.
- **Excellence in Academics Certificate, Fall 2012**, Lambda Eta Chapter, IEEE-HKN, BVCOE, New Delhi.
- **Winner, TCS Mobeel 2012, (out of 247 teams)**, All India Mobile application development competition. I was the **team lead** in a team of 3.
- **Won** 3 other inter college C++ programming contests including second position at the AI Challenge (NSIT, Delhi) 2010-2013.
- **Academic Excellence Award** by GHPS for securing highest marks in Maths and Computer Science.

PATENTS

- Aman Madaan, Jagdish Chand, Somashekhar Pammar, Venkata Sesha Rao Polavarapu, Sunil Sharma, Tarun Jain, Dirk Reinshagen, Derek Vroom, et al. Segmentation platform, August 23 2018. US Patent App. 15/436,458
- Ranjan Dutta, Varun Sharma, Aman Madaan, Somashekhar Pammar, and Zian Huang. Database conditional field access, July 26 2018. US Patent App. 15/414,145

TEACHING EXPERIENCE

- **Foundations of Machine Learning, CS 725, IIT Bombay** (Jan 2015 - May 2015)
  Teaching Assistant to Prof. Saketha Nath
  - Responsible for designing the programming assignments. The class had around 100 PhD, Masters' and Senior undergraduate students.
  - Awarded the **best TA award** for work in this class by the Dept. of CSE (award link `https://www.cse.iitb.ac.in/page106?year=2015`).
- **Data Analysis and Interpretation, CS 215, IIT Bombay** (July 2014 - Nov 2014)
  Teaching to Prof. Ganesh Ramakrishnan
  Responsible for designing assignments that involve interesting analysis and visualization questions around open source datasets. Took sessions and tutorials on Scilab, responsible for handling the course website and the course Piazza page.

SKILLS

Background Responsible for the design and development of several batch and real time data analytics/machine learning pipelines for Internet-scale datasets in both industry and research settings.

Tools Professional experience with state of the art frameworks for developing data/machine learning solutions including Apache Spark, Hadoop Ecosystem, Deeplearning4j, Tensorflow, Scikit-Learn, NLTK. Fluent in Scala, Python, Java, C++ and Bash and the corresponding development environments.

SELECTED GRADUATE COURSEWORK

- Machine Learning, Natural Language Processing, Organization of Web Information (Advanced Web Mining), Probabilistic Graphical Models, Statistical Machine Translation, Statistical Performance Evaluation of Systems and Networks, Software Architecture, Convex Optimization

VOLUNTEER EXPERIENCE

- **Students Technical Activities Body, IIT Bombay** (May 2014 - June 2014)
  Project Mentor for Institute Technical Summer Project
  Mentored a team of 2 undergraduate students towards the development of an Android application and web back-end that makes organizing fests easier. Took sessions on server-side scripting, Android application development, version control and UI development.
- **Calligra** (Feb 2013 - April 2013)
  Open Source Contributor
  Developed features and submitted fixes to the Calligra, a free and open source office suite (`https://git.reviewboard.kde.org/r/109746/`). The features have been incorporated in the distribution.
- **BVP Linux User Group** (`https://bvplug.github.io/`) (August 2012)
  Founder Member
  The LUG was started with the goal of introducing students to free and open source software and to encourage students to contribute to open source. Many students who were introduced to open source via BVPLUG continue to actively contribute to the open source to date.