Madhavan **R.P**

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Education

Iowa State University   *Ames, Iowa*
PH.D (M.S) - COMPUTER SCIENCE   *Dec 2021 (expected)*
GPA 3.83/4.00

Anna University   *Chennai, India*
BACHELOR OF ENGINEERING - COMPUTER SCIENCE AND ENGINEERING   *May 2011*

Skills

Languages/Tools	Java, Python, C++, C, Git, UNIX Shell
Areas of Proficiency	Graph-Based & Randomized Algorithms, Data Structures

Experience

Iowa State University   *Ames, Iowa*
GRADUATE RESEARCHER   *July. 2017-present*

- Researching novel problems on how to maximally spread information in large social networks.
- Designed an approximate algorithm with an additive error for Budgeted Submodular Maximization under a Sub-modular Constraint.
- Created an efficient probabilistic algorithm to spread information to targeted users while avoiding adversaries - Constrained Influence Maximization (CIM) problem
- Designed an algorithm that improved the information spread by 12% while running almost 100 times faster than the existing state of the art solution.
- Programmed the algorithms in C++ to achieve high practical performance on graphs with 1.6 million nodes and 30 million edges.
- Efficiently used data structures to store the graphs allowing for blazing fast implementations of graph traversal algorithms.

Schrödinger   *NYC, NY*
BACKEND ENGINEER - INTERN   *Jun. 2021 - Aug. 2021*

- Designed an architecture for a microservice that efficiently managed storage and retrieval of key-value pairs.
- Implemented a Flask application with a Postgres database and a REST API that enabled easy integration with other services.
- Integrated the microservice with Apache Kafka by communicating messages, storing data on Kafka Topics.
- Created Docker images for the components of the microservice and deployed the application using Kubernetes and Tilt.

Iowa State University   *Ames, Iowa*
GRADUATE TEACHING ASSISTANT   *2016-present*

- Assisted in several courses including Big Data Algorithms, Design and Analysis of Algorithms, Programming in Java.
- Head TA for an Algorithms course consisting of 300 students and managed 10 Teaching Assistants.
- Gave weekly supplementary instruction to sections of 20-30 students.
- Gave lectures on selected topics in probabilistic algorithms to a graduate level course consisting of 50 students.
- Implemented probabilistic data structures such as Bloom Filters, Count Min Sketch and applied it to create Web Crawlers, Information Retrieval Systems which were used as a benchmark for student submissions.
- Created a framework using a combination of Python scripts and Java programs that automatically graded student programs.

NP Compete Technologies   *Chennai, India*

Technical Staff Member   *Oct. 2011-Sept. 2014*

- Developed an Android SDK that enabled businesses to detect user actions and make dynamic UI changes to their existing mobile applications in real-time.
- Designed and implemented a comprehensive testing strategy by writing module-level JUnit tests and defining product-level use case scenarios.
- Defined and created a novel Contact Management application that enabled users to easily access and manage their contacts across various social networks and platforms.
- Implemented a Flask web application to collect user's contact information via OAuth and store it in user's Dropbox.
- Technical lead of a team of 4 programmers, managing product features, software design choices, coding standards and continuous integration.
- Implemented a tool in python that processed and categorized emails using Naive Bayes Classification.
- Initiated a team-wide peer code review practice that contributed to accelerated development.
- Utilized experience in iOS and the Android platform to solve project-specific problems for various development teams.

Relevant Coursework

Iowa State University   *Ames, Iowa*

Machine Learning, Optimization for Machine Learning, Artificial Intelligence

- Learned fundamental machine learning algorithms - Gradient Descent, Support Vector Machines, Linear Regression. Applied techiques on classification problems using Keras, Scikit-learn.
- Performed theoretical analysis on First-Order Methods - Gradient descent, Stochastic gradient descent.
- Designed and implemented several AI agents by employing classic techniques such as A* search algorithm, Alpha-beta pruning.

Extracurricular Activity

Computer Science Graduate Student Organization   *Ames, Iowa*

Senator and Committee Member   *Aug. 2017 - May 2018*

- Organized a Research Networking Event that enabled new graduate students to connect with research groups/labs.
- Represented the Computer Science Department as a senator in the Graduate and Professional Student Senate.

Sankalp at Iowa State University   *Ames, Iowa*

Volunteer   *Dec. 2017 - May 2018*

- Volunteer for Sankalp, a student organization raising funds to support developmental, educational projects in India to improve social and economic conditions.
- Conducted a fundraising campaign targeted to faculty of the Computer Science Department to support Daawat 2018, an annual dinner hosted by Sankalp.

National Society of Black Engineers   *Ames, Iowa*

Graduate Student Advisor - Iowa State University Chapter   *Jan. 2019 - May 2020*

- Served on the executive council organizing various networking events.
- Served on the graduate student panel of the Iowa State NSBE Chapter's Graduate School information session.
- Mentored undergraduate students, publicised research opportunities to chapter members.

Publications and Awards

2018   **IEEE BigData**, "Influence Maximization in Social Networks With Non-Target Constraints" (18.9% acceptance)

2018   **Atanasoff Award Winner**, In recognition of Academic, Research performance (1 of 193 graduate students)

2020   **IEEE ASONAM**, "Measuring the Impact of Influence on Individuals: Roadmap to Quantifying Attitude" (21% acceptance)

2021   **SNAM Journal**, "Measuring the Impact of Influence on Individuals: Roadmap to Quantifying Attitude"