

# Arjun R. Rao

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## Education

### University of Colorado, Boulder

Boulder, US

#### M.S. IN COMPUTER SCIENCE

Aug. 2019 - May 2021

- **Research Assistant** under Prof. Sidney D'Mello

### Ramaiah Institute of Technology (RIT)

Bangalore, India

#### B.E. IN INFORMATION SCIENCE AND ENGINEERING

Aug. 2014 - June 2018

- CGPA: **9.41/10**
- **Best Outgoing Student** (Batch of 2014-2018), Dept. of Information Science & Engineering

## Industry Experience

### Stride.ai Inc. (A TechStars Company)

Bangalore, India

#### NLP ENGINEER

July 2018 - May 2019

- **ACE:**
  - Worked on building Stride's flagship product, ACE, which supports document classification and information extraction using limited labelled data. I was responsible for the entire UI/UX design of the project in-addition to contributing to Backend APIs.
  - Built a **custom python library** that allows users to **train, evaluate ML models and perform inference** for document classification tasks in ACE using Tensorflow and Keras.
- **Backend and APIs:**
  - Designed database schemas and implemented RESTful APIs using Django and techniques like request caching, polling, and message queues (Redis-Queues).
  - Worked on defining API contracts between the Backend and Frontend teams and built client libraries for abstracting API calls.
- **Frontend Libraries and Frameworks:**
  - Standardized the design language and theme for all Stride products
  - Built Stride's **core frontend framework** with reusable components and custom styles using **Angular**.
  - Built a custom PDF Viewer library with Angular support using PDF.js that allowed user annotation functions, support for multiple monitors, intelligent document comparison, and cross-browser support. The viewer is being used in 10+ Projects and efficiently handles PDFs with over 500 pages.
- Technologies Used: **Python, Django, Typescript, Angular, Keras, Tensorflow, D3.js, PDF.js, Internal tools**

#### RESEARCH AND DEVELOPMENT INTERN

Nov. 2016 - Dec. 2016, Jan. 2018 - Apr. 2018

- Worked on **optimizing Named Entity Recognition (NER) models** to improve performance by combining standard NER datasets with context specific data. This work was later extended and converted into an internal library for building custom NER models using augmented datasets.
- Built **scrapers** for automatically extracting information from multiple websites using Selenium and BeautifulSoup.
- Technologies Used: Python, Tensorflow, Keras, Gensim, Selenium

### Google Inc.

San Francisco, US

#### DEVELOPER PROGRAMS ENGINEER INTERN, CLOUD DEVELOPER RELATIONS

June 2017 - Aug. 2017

- Was an intern on the Cloud DPE team, and worked on 2 projects as an individual contributor responsible for both design and implementation.
- **GitHub Issue Tracker:**
  - Developed a web app that allows users to configure public GitHub repositories to receive **consolidated email notifications** for events like new issues, comments, etc.
  - The tool greatly reduced the number of email notifications received in a day from GitHub by summarizing all activity across configured repositories into a single digest email.
  - Link to open source release: [github.com/GoogleCloudPlatform/issue tracker](https://github.com/GoogleCloudPlatform/issue tracker)
- **GitHub Issues Mirror:**
  - This was a project to mirror issues and comments on configured GitHub repositories into the internal bug tracker to allow Googlers to triage and track issues in a centralised place.
  - I used internal libraries, and **App Engine** to coordinate cron jobs to synchronize internal bug entries with GitHub data in **BigQuery**.
- Technologies Used: **Go, Angular, Google Cloud Datastore, Google BigQuery, Google App Engine**

## Skills

**Programming Languages** Python, TypeScript, Go, Java, C/C++, PHP

**Platforms & Frameworks** Django, Tensorflow, Angular, Android, Google Cloud Platform, Express

**Languages** English (Native Language), Hindi, Kannada

## Academic Experience

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### Ramaiah Institute of Technology

Bangalore, India

#### SENIOR PROJECT - THE MILO IDE (MILOIDE.GITHUB.IO)

Sept. 2017 - April 2018

- Built a web-based IDE to help students with no prior programming experience learn Machine Learning and Linear Algebra.
- Customized **Google's Blockly project**, and designed a visual programming language that supports data science operations.
- Implemented a data explorer with built-in datasets along with support for using custom numeric, image and textual datasets.
- Implemented common ML algorithms using **Tensorflow.js** as blocks and used **D3.js and Plotly.js** for interactive visualizations.
- Presented and published a paper based on a user study with the IDE at IEEE VLHCC 2018 (See Publications).
- Technologies Used: **Node, Javascript**

#### TEACHING ASSISTANT, APPLIED CS WITH ANDROID COURSE DESIGNED BY GOOGLE

Jan. 2017 - May 2017

- Handled **25 two-hour tutorial sessions** for a class of **52 students**.
- **Developed codelabs, internal sites, auto grading systems** for assignments.
- Based on my work, RIT was selected as **one of the 5 universities worldwide, to be featured in a case study** for University Adoption of the program. Link: [https://appliedcsskills.withgoogle.com/case-studies/AppliedCS\\_RIT.pdf](https://appliedcsskills.withgoogle.com/case-studies/AppliedCS_RIT.pdf)
- Technologies Used: **Android, Java, Go, Javascript**

## Workshops & Talks

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### Cloud Study Jam

Bangalore india

#### FACILITATOR, GOOGLE DEVELOPER GROUPS BANGALORE

Feb. 2019

- Conducted a day long hands-on workshop on ML and Google Cloud.
- Topics covered: Intro to Kubernetes, Cloud ML APIs, Cloud ML Engine.
- Used the QwikLabs platform to conduct hands-on sessions
- Link to Slides: <https://goo.gl/wPFBsZ>

### Learning AI Development and UX

Bangalore india

#### SPEAKER FOR WOMEN TECH MAKERS BANGALORE'S SESSION ON LEARNING AI DEVELOPMENT

Dec. 2018

- Conducted a day long hands-on workshop on AI development.
- Topics covered: Text classification, Word Embeddings, Feature Engineering, Serving ML Models in Production.
- Used Google's Colab environment to design hands on exercises using Keras and Scikit-Learn.
- Link to Slides: <https://goo.gl/x7EtyM>

### Apps Script Study Jam

Bangalore, India

#### FACILITATOR FOR GDG BANGALORE'S WORKSHOP ON GOOGLE APPS SCRIPT

Feb. 2018

- Conducted a day long hands-on workshop on Google Apps Script for Google Developer Groups Bangalore (GDG Bangalore).
- Topics: Google Apps Script, Automating workflows with Apps Script, Google Clasp, Integrating third-party services with Apps Script.
- Link to Slides: <https://goo.gl/ZH8WQK>

### The Power of Google Apps Script

Bangalore, India

#### SPEAKER FOR GDG BANGALORE'S DEVFEST

Oct. 2017

- Introduced Google Apps Script with use cases, workflows and demos at Google Developer Groups Bangalore's annual developer conference.
- Link to Slides: <https://goo.gl/9gfUUq>

## Select Publications

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### Milo: A visual programming environment for Data Science Education

Lisbon, Portugal

#### ARJUN R RAO, AYUSH BIHANI, MYDHILI K NAIR

Oct. 2018

- Proceedings of 2018 IEEE Symposium on Visual Languages and Human-Centric Computing (**VL/HCC'18**), pp. 211-215. [PDF]
- Designed and implemented a novel **visual programming environment** to help novice students and non-programmers learn **Data Science and ML concepts** using block based programming.
- DOI: 10.1109/VLHCC.2018.8506504

### Context Based Approach for Second Language Acquisition

New Orleans, USA

#### NIHAL V NAYAK, ARJUN R RAO

June 2018

- System paper for Duolingo's shared task on Second Language Acquisition Modelling (**SLAM 2018**). [PDF]
- Published in the Proceedings of the **NAACL-HLT Workshop** on Innovative Use of NLP for Building Educational Applications (**BEA at NAACL 2018**).
- Trained a logistic regression model to predict the likelihood of a student making a mistake while answering an exercise on Duolingo. Made use of features inspired by research in **code-mixed language learning** where context plays an important role.
- Result: **AUROC scores for English/Spanish = 0.821**, Spanish/English = 0.790 and French/English = 0.812. **2<sup>nd</sup> best linear model**, finished 9<sup>th</sup> overall in SLAM 2018