

ARCHIT CHECKER

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EDUCATION

Ashoka University
3rd Year Undergraduate
Department of Computer Science

August 2017 - Present
CGPA: 3.85/4
Major CGPA: 3.86/4

RESEARCH INTERESTS

Computer Architecture, Operating Systems, Architectural Security

RESEARCH IN PROGRESS

AMBOP: Adaptive Multiple Best Offset Prefetcher
Arup Mondal, Sarabjeet Singh, Archit Checker, Manu Awasthi

PROJECTS

Enron e-mail Dataset Clustering
Advisor: Prof. Ravi Kothari, Ashoka University
Tools: Python, Gensim, Numpy, Pandas, NLTK, SKLearn

Nov 2019 - Dec 2019

- Used LDA to do Topical Modelling of the Enron e-mail Dataset.
- Best achieved coherence value of 0.58 with 5 topics.
- Best achieved perplexity value of -8.2 with 7 topics.
- Visualizations can be found **here** and **here**. Full report - **here**.

Architectural Exploration of Memory Hierarchies
Advisor: Prof. Manu Awasthi, Ashoka University
Tools: C

September 2019 - Present

- Studied about various **side-channel attacks**, and Principles of Secure Processors and Architectures.
- Studied about **Prime + Probe**, **Flush + Reload**, and **Evict + Reload** attacks in depth.
- Mounted Flush + Reload on GnuPG.
- Implemented the Spectre attack.

HearMyCI
Advisor: Prof. Michael Burger, Lehigh University
Tools: Python, MATLAB, Django, HTML, CSS, JS

Summer 2019

- Led technical development on an app to provide reliable **cochlear implant simulations** to the caregivers of children with hearing loss.
- Used **Digital Signal Processing** Techniques to accurately simulate cochlear implant models of the top 3 CI companies.
- Developed a prototype **web application using Django and Python** with functionality for user profiles and customization.
- Visited a facility for the deaf and met with various Speech-Language Pathologists, and parents of the deaf. Collaborated with Entrepreneurship experts and met with a patent lawyer.

Memory Systems Evaluation

March 2019 - May 2019

Advisor: Prof. Manu Awasthi, Ashoka University

Tools: *ChampSim, Python*

- Implemented a **Tree Pseudo-LRU** replacement policy in **ChampSim** and evaluated it.
- Studied the effects of various possible bit indexing schemes for **bimodal branch predictors** by implementing a simulation in Python.
- Studied emerging memory technologies like **Phase Change Memory (PCM)**, **Spin-Transfer Torque Ram (STT-RAM)**, **Resistive random-access memory (ReRAM)** and **3D stacked memory**.

Surf

Winter 2018

Advisor: Prof. Sudheendra Hangal, Ashoka University

Tools: *Java, JSP, Apache, HTML, CSS, JS*

- Worked on adding features to Surf - a name resolution software for Indian Political Data.
- Added functionality for reading **custom datasets and real-time ID, Column, and Sort specification changes** to Surf.
- **Mined normalization rules using Edit-Distance** to improve the Surf clustering algorithm.

ClassifierC

September 2018 - November 2018

Tools: *C, Python*

- Studied about Bayesian Classification, Naive Bayes, Linear Regression, and K-means clustering.
- Implemented a **Naive Bayes Classifier, and a K-Means Clustering Algorithm in C**.
- Used Python to pre-process various datasets (Iris, Pima Indian, Loan Prediction, Black Friday etc.) and surveyed accuracy on the C implementations.

Ruhi

December 2017 - January 2018

Tools: *Python, Flask, SQLite3, HTML, CSS, JS*

- Ruhi is a project started to help the support staff at Ashoka University learn English.
- Implemented a web-application for the Ruhi tutors for automatic allocation, feedback, and report management.

INTERNSHIPS

Lehigh University

Research Intern

Project : *HearMyCI*

Summer 2019

Advisor : Prof. Michael Burger

Trivedi Centre for Political Data

Full Stack Development Intern

Project : *Surf*

Winter 2018

Advisor : Prof. Sudheendra Hangal

AWARDS AND HONORS

- Qualified for the Regionals - International Collegiate Programming Contest (**ICPC**) November 19
- Selected for Undergraduate Architecture (uArch) Workshop at **ISCA 2019** April 19
- Secured a position in **Dean's List** for excellent academic performance. All Semesters
- Won the first prize in IIM Indore's Leadership competition - Chaitanya. September 18
- Finalist in Digital Masala Challenge hackathon by Facebook and YKA. December 2017

TECHNICAL SKILLS

Programming Languages	Python, C, Java, C++, Assembly, Shell Scripting
Simulators	ChampSim, Mastik
Frameworks and Tools	Django, Flask, Numpy, Pandas, Keras, L ^A T _E X

RELEVANT COURSEWORK

• Architectural Exploration of Memory Hierarchies • Advanced Computer Architecture • Operating Systems • Design and Analysis of Algorithms • Computer Security and Privacy • Introduction to Machine Learning • Advanced Programming • Theory of Computation

TEACHING

- TA [Spring 20] - Operating Systems
- TA [Monsoon 19] - Fundamentals of Computer Programming *Student Feedback - 4.67/5*
- Helpdesk Tutor - Computer Organization and Systems

LEADERSHIP

Computer Science Academic Representative	<i>2019 - 2020</i>
Ashoka Academic Advisory Board	
CS Curriculum Developer	<i>2019</i>
Neev Program - Teaching Underprivileged Children	