Nihal Kumar **Singh**

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Education

Georgia Institute of Technology   *August 2019 - Present*
M.S. in Computer Science

Inidan Institute of Technology, Bombay   *July 2015 - May 2019*
B. Tech. in Civil Engineering   *CPI - 8.74/10*
Minor in Computer Science and Engineering   *CPI in CS courses- 9.2/10*

Research and Work Experience

Language Modelling and Synthesis of Code-Switched text   *IIT Bombay*
Guide: Prof. Preethi Jyothi, IIT Bombay [CSALT] [Paper]
((in collaboration with Microsoft Research)   *Dec 2018 - May 2019*

- Created *MovieCS-* a dataset containing conversational code-switched Hindi-English text extracted from contemporary Hindi movie scripts; more natural, more mixing than existing Twitter corpora.
- Studied the effectiveness of heuristic and linguistic theory based methods for generating synthetic code-switched text by examining their effect on language model performance. Released benchmark performance of state-of-the-art language models on this corpus.
- Using the MovieCS corpus as a test bed, we proposed several training schedules, deriving significant reductions in perplexity using the synthetically generated datasets.

Software Engineering Internship, Android   *Tokyo, Japan*
Mercari, Japan [Blog]   *May 2018 - July 2018*

- Developed the listing templates feature to auto-fill item information while selling on the Android app of Mercari, the largest CtoC marketplace in Japan. Implemented the Model-View-Presenter (MVP) architecture pattern while adopting the Test Driven Development approach in my workflow.
- Worked with the Design, Backend, QA and the entire Android team in a multicultural environment to drive the feature to completion. Wrote unit-tests using Mockito and Robolectric, set up CI automation and learned to write Kotlin.
- Received a **Pre-Placement Offer to join full-time**, based on my performance as an intern.

Google Summer of Code   *Open Source*
MovingBlocks- Terasology [Project Page] [Official Blog]   *May 2017 - July 2017*

- Developed Lost- a new gameplay mode with puzzles, traps and exploration based content.
- Dealt with the game's physics, multiplayer and Entity Component System. Created new modules for AdvancedBehaviors (for event driven behavior switching), AdventureAssets (for physics based trap elements), Journal (for an interactive in-game diary) and added WildAnimals to the game.

Google Summer of Code and Google Code-In Mentor   *Open Source*
MovingBlocks- Terasology [GCI 2016] [GSoC 2018]   *'16, '17, '18 and '19*

- Mentored the multi-world and the L&S Capture The Flag project in GSoC '18 and '19. Nominated to represent the organization at the GSoC '18 Mentor Summit held at Google HQ, Sunnyvale, CA.
- Involved as a mentor since the organization's first Google Code-In participation. GCI is a pre-university level Google Summer of Code. Extensively coordinated and assisted in reviewing and authoring tasks. Documented guides to help students in getting started.

Projects

NeurIPS 2018 Pommerman Challenge [Project Page]
CSE, IIT Bombay

REINFORCEMENT LEARNING COURSE PROJECT UNDER PROF. SHIVARAM KALYANAKRISHNAN
Fall 2018

- Investigated several strategies for multi-agent learning problems and studied the advantages of using imitation learning approaches using the Pommerman platform. Designed and submitted agents based on Deep Q-Learning from Demonstration and Proximal Policy Optimization.

Voice Conversion [Project Page]
CSE, IIT Bombay

MACHINE LEARNING COURSE PROJECT UNDER PROF. PREETHI JYOTHI
Spring 2018

- Built a pipelined approach to convert one person's voice into another person's voice. Proposed a deep learning approach to convert source waveform to phonemes and further phonemes to target waveform. Trained on TIMIT and CMU ARCTIC corpus respectively.
- Performed extensive experimentation with bi-directional Recurrent Neural Networks using LSTM and GRU cells. Adopted a multitask training approach by evaluating loss over an intermediate state with a pyramidal network architecture.

Secure Authenticated Fast Exams Application [Website]
CSE, IIT Bombay

R&D PROJECT UNDER PROF. BHASKARAN RAMAN
Fall 2016

- Worked for the development of the SAFE Android application that facilitates online paperless tests in educational institutes.
- Multiple devices concurrently connect to a Wireless Access Point to fetch test data with action-logging happening in real time at the invigilator's console. Worked on fetching and displaying of performance history and correct/incorrect answer visuals on the app.

MooDLD- Moodle Downloader [Code]
UG Academic Council IIT Bombay

- Built a Moodle downloader in Python with Tkinter GUI and on Android to download and segregate course material (for Moodle version < 2.4, where Moodle Mobile wasn't compatible). Published by the Institute's Academic Council for institute wide usage; deprecated since Moodle version bump to allow support for official Moodle Mobile app.

J.A.R.V.I.S.- Personal Assistant [Code]
Hobby Project

- Used the Python AIML library to create a personal assistant that responds to voice and text commands. Leveraged text to speech and speech to text systems, employing basic pattern recognition.

Steganography Tool [Code]
Digital Image Processing Course Project

- Implemented a steganography tool using MATLAB with custom terminal GUI. Implemented variations of encryption algorithms using Least Significant Bit to encrypt/decrypt text within an image with a custom passphrase.

Achievements

Jan 2019	**Matic Prize**, in the Blockchain track at the **E-Cell i-Hack** competition.	*IIT Bombay*
Oct 2017	**Finalist**, **Digital Ocean Campus Champ** Contest- build an application prototype	*Online*
Oct 2017	**1st Place**, **Ubisoft GameJam**- 48 hour GameJam at Ubisoft Pune studios	*Ubisoft Pune*
Mar 2017	**Yahoo! Prize**, The "most creative and fun hack" in **Yahoo! Japan**'s hackathon	*IIT Bombay*
Dec 2016	**Runner Up**, **Microsoft Code.Fun.Do** institute wide hackathon	*IIT Bombay*
Aug 2016	**5th Place**, **Hack InOut**- out of 1000+ teams in India's largest hackathon	*NIT Surat*
Mar 2016	**Runner Up**, **Kandy Hackathon**- institute wide open hackathon	*IIT Bombay*
Sep 2015	**2nd Place**, **Lenovo Game Jam**- institute wide Game Development hackathon	*IIT Bombay*

Positions of Responsibility

Manager *IIT Bombay*
WEB AND CODING CLUB, INSTITUTE TECHNICAL COUNCIL [WEBSITE] *Apr. 2016 - Mar. 2018*

- Led an institute wide team of 22, as part of one of the biggest college technical clubs in India, to conduct hobbyistic programming activities in the institute. Organized multiple talks, workshops and competitions. Awarded the Institute Organizational Color 2017-18.
- Organized and conducted the first ever, Data Science Day, consisting of a Panel Discussion, talks from Professors and the Mumbai chapter of Stanford's Women in Data Science conference to supplement the learning of students in the associated fields.
- Conceptualized and built the community wiki and the internship portal. Started the WnCC YouTube channel for knowledge sharing.
- Established ties with Google Developers Group- Mumbai, Ubisoft, Yahoo! Japan, Microsoft, Mercari and multiple other sponsors.

Web and Tech Coordinator *IIT Bombay*
WEB AND CREATIVES, MOOD INDIGO [WEBSITE] *Sep. 2016 - Dec 2016*

- Created the official app for Mood Indigo, Asia's largest college cultural festival with a footfall greater than 1.31 Lakhs. (5k downloads)
- Implemented core backend functionality in the app, fetching events and creating timely notifications for subscribed events.

Relevant Courses

Computer Science	Computer Programming and Utilization, Data Structures and Algorithms, Design and Analysis of Algorithms, Computer Networks, Operating Systems, Introduction to Machine Learning, Reinforcement Learning, Computer Graphics, Advanced Machine Learning
Others	Calculus, Linear Algebra, Probability and Statistics, Differential Equations, Economics, Quantum Physics, Linguistics

Skills

Comfortable	C/C++, Python, Java, Android, HTML/CSS
Familiar	JavaScript, Django, OpenCV, Bash, Ruby, PHP, Jekyll, MySQL, SQLite, Arduino
Software/Tools	Tensorflow, MATLAB, Octave, Git, Adobe After Effects, NCH Video Pad, LaTeX

Miscellaneous

Journalism	Selected in the Times of India- NIE student camp for junior-journo in 2011 to be trained under Nikhat Kazmi. Authored and edited independent articles published in Times of India - NIE.
Sports	Swimminig- Completed the 12 hour Swimathon '16. Football- Inter-school Football player.
Interests	Music, Gaming, Videography and Travelling