Aravind Reddy Talla

Curriculum Vitae

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Education

2018   **Indian Institute of Technology Kanpur**, *Kanpur, Uttar Pradesh, India*,
B.Tech in Computer Science & Engineering with minor in Physics, CPI - 8.7/10.

2014   **Sri Chaitanya Narayana Junior College**, *Vijayawada, Andhra Pradesh, India*,
98.0%(State top one percentile) in Intermediate exams conducted by BIE, A.P..

2012   **Dr. K.K.R's Gowtham Concept School**, *Hyderabad, Telangana, India*,
GPA - 9.7/10 in the SSC examinations conducted by BSC, A.P..

Research Internships

Summer 2017   **Paris Centre for Quantum Computing**, *Université Paris Diderot*, Paris.
Mentors: *Prof. Eleni Diamanti, Prof. Iordanis Kerenidis*   Partly funded by Charpak
Outline: We designed two new protocols for quantum repeater networks for sharing tripartite entangled states. I analyzed them analytically and also performed their Monte Carlo simulations using Octave. Results in preparation.

Summer 2016   **Centre for Quantum Technologies**, *National University of Singapore*, Singapore.
Mentor: *Prof. Hartmut Klauck*
Outline: Studied about communication complexity in general and relations between query and communication complexities of a subclass of composed functions(related to "Rectangles are Nonnegative Juntas" by Göös et.al)

June & December 2015   **Indian Institute of Science Education and Research**, *Kolkata*.
Mentor: *Prof. Prasanta K. Panigrahi*   Funded by the NIUS Scholarship
Outline: Studied about quantum computing in general and some aspects of quantum cryptography like QKD protocols and quantum money schemes.

Awards & Scholastic Achievements

2017   **Charpak Scholarship for research internship**, *French Government*.

2015   **National Initiative on Undergraduate Science Scholarship**, *HBCSE(TIFR)*.

2015   **Academic Excellence Award**, *IIT Kanpur*.

2014   **Gold Medallist**, *Indian National Physics Olympiad*, National top 35, participated in the Orientation cum Selection camp(OCSC) for the Indian team for International Physics Olympiad 2014.

2014   **Ranked 189 out of 120 thousand applicants**, *JEE Advanced*.

2014   **Ranked 206 out of 1.4 million applicants**, *JEE Main*.

Coursework: (∗)Graduate course, (†)Fall 2017, (‡) Spring 2018

Theoretical Computer Science	Quantum Computing*, Modern Cryptology*, Computational Complexity†*, Algorithmic Game Theory‡*, Approximation Algorithms‡*, Linear Algebra for TCS‡*, Theory of Computation, Algorithms, Discrete Mathematics, Abstract Algebra, Logic
Other CS	Machine Learning†*, Computer Networks†, Operating Systems, Compilers, Computer Organisation, Computing Tools(lab)
Physics	Quantum Mechanics 1†, Quantum Physics, Thermal Physics‡, Relativity‡
Online courses	Quantum Information Science II*(edX certificate), Quantum Cryptography(edX certificate), Human Evolution(edX certificate), Systematic Program Design(edX certificate)

Course Projects at IIT Kanpur

Fall 2016 — **Quantum Entanglement & Nonlocal Games**.
Mentor: *Prof. Rajat Mittal*, Dept. of Computer Science and Engineering
Outline: Studied about Nonlocal games and their quantum strategies. Report.

Spring 2016 — **Certified Randomness Generation using Quantum Non-Locality**.
Course Project for CS682(Quantum Computing)
Outline: Studied Quantum Non-Locality and one of it's applications to certified randomness generation. Report

Spring 2017 — **Breaking Cryptosystems**, *Modern Cryptology by Prof. Manindra Agrawal*.
The 'assignment' in this course was a text adventure game which involved breaking various ciphers to clear a particular level. Over the course of the semester, we broke:
○ Substitution cipher ○ Block substitution cipher ○ Substitution-Permutation cipher
○ DES (with differential cryptanalysis) ○ SASAS (AES like attack) cipher
○ RSA (with low public exponent, using Coppersmith's LLL based attack) ○ A hash function

Fall 2017 — **Handwritten Mathematical Expression Recognition**, *Machine Learning*.
Developed a tool which uses a CNN to convert an image of a handwritten mathematical expression to it's corresponding LaTeX code. Slides, Report

Spring 2017 — **C Compiler**, *Course project for CS335(Compiler Design)*.
Developed a compiler for a subset of C to x86 assembly using Python & Plex.

Fall 2016 — **Extensions for NachOS**, *Course project for CS330(Operating Systems)*.
Implemented some system calls, process scheduling algorithms and page replacement algorithms to extend the functionality of NachOS operating system.

Skills:

Programming	C, Python, Bash, Octave, Julia, Racket, Verilog, x86 Assembly
Web-Dev	HTML, CSS, Hugo, PHP, SQL
Tools	LaTeX, Git, GNU Plot, Jupyter, Xfig, Wireshark
Languages	Telugu(native), English(fluent), Hindi(fluent)

Selected talks

July 2017	**Communication protocols for tripartite entangled state sharing networks**, LIP6, Université Pierre et Marie Curie, Paris.
Nov 2016	**Quantum Entanglement & Nonlocal games**, SIGTACS, IITK, Slides .
Sept 2016	**Introduction to TCS**, *for freshman students*, ACA, CSE IITK.
June 2016	**Rectangles are Nonnegative Juntas**, *CQT CS Talk*, Singapore.
April 2016	**Is it really random?**, Science CoffeeHouse, IITK.
Jan 2016	**Nature and Certification of Randomness**, ACA, Slides .

Campus Leadership

2016-17 term — **Science CoffeeHouse**.
- Organised several student talks on interesting scientific topics.
- Prepared questions for several events and was part of the team which organised a treasure hunt in Takneek, the inter hostel technical competition.

2016-17 term — **Association for Computing Activities**.
- Led the student body of the CSE department and organised several events like informal Faculty-Student interaction sessions, programming competitions and hackathons.
- Allocated senior student mentors to freshmen for guided semester projects.

2016-17 term — **Card & Board Games Club**.
Organised several board game meetups and conducted inter hall(student residence) competitions in Dominion and Carcassonne.

July 2015 - Oct 2015 — **English Literary Events, Antarãgni**.
Organised various literary events as a part of the annual institute cultural festival. There were over 300 student participants from various universities.

Miscellaneous

- Volunteer for FSTTCS 2017, IIT Kanpur

- Attended TQC2017, LIP6, UPMC

- Attended Shannon Centenary celebrations, IIT Kanpur.

- Awarded distinction in initial grade keyboards exam, rock and pop organised by Trinity School of Music, London in December 2015.