William Kumar Moses Jr.

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ACADEMIC INTERESTS

- Distributed Algorithms
- Algorithms

EDUCATION

- **Indian Institute of Technology Madras** — Chennai, India
  Ph.D. Computer Science and Engineering — *2012 - present*

  - Specialized in Distributed Algorithms.
  - Secured a **CGPA of 8.25**.

- **Indian Institute of Technology Madras** — Chennai, India
  M.S. by Research Computer Science and Engineering — *2009 - 2012*

  - Specialized in Rational Cryptography with an emphasis on Rational Secret Sharing.
  - Secured a **CGPA of 9.4/10**.

- **Acharya Nagarjuna University** — Vijayawada, India
  B. Tech. Computer Science and Engineering — *2005 - 2009*

  - Secured an **aggregrate percentage of 84%**.

SCHOLASTIC ACHIEVEMENTS

- Placed in the **national top three percentile** in 2008 and **national top two percentile** in 2009 in the Graduate Aptitude Test in Engineering (GATE) out of approximately 18,000 and 40,000 candidates respectively.
- Secured a **rank of 2434** in the Engineering Agriculture and Medicine Common Entrance Test (EAMCET) out of approximately 80,000 students in 2005.
- Was an All American Scholar in 2001.

AWARDS

- Won Best Paper (Poster) Award at XRCI Open 2016 for poster on "Balanced Allocation: Patience is not a Virtue".
- Awarded IBM Research India Promising Researcher Award in 2015.
- Won the Outstanding Teaching Assistants Award for the July - November 2009 semester when I worked for the Computational Engineering course.

PUBLICATIONS

- John Augustine and William K. Moses Jr., Dispersion of Mobile Robots: A Study of Memory-Time Trade-offs. To appear in *Proceedings of the 19th International Conference on Distributed Computing and Networking (ICDCN 2018)*.
- Ankush Agarwalla, John Augustine, William K. Moses Jr., Madhav Sankar K., and Arvind Krishna Sridhar, Deterministic Dispersion of Mobile Robots in Dynamic Rings. To appear in *Proceedings of the 19th International Conference on Distributed Computing and Networking (ICDCN 2018)*.

- John Augustine, William K. Moses Jr., Amanda Redlich, and Eli Upfal, Balanced Allocation: Patience is not a Virtue, *Proceedings of the Twenty-Seventh Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2016)*, pp. 655 – 671.
- William K. Moses Jr. and C. Pandu Rangan, Rational Secret Sharing over an Asynchronous Broadcast Channel with Information Theoretic Security, *International Journal of Network Security & Its Applications (IJNSA)*, pp. 1 – 18, Vol. 3, No. 6, Nov 2011.
- William K. Moses Jr. and C. Pandu Rangan, Rational Secret Sharing with Honest Players over an Asynchronous Channel, *Proceedings of the 4th International Conference of Network Security and its Applications (CNSA 2011)*, pp. 414 – 426, CCIS 196.

MANUSCRIPTS/PAPERS UNDER SUBMISSION

- Dariusz R. Kowalski, William K. Moses Jr., and Shailesh Vaya, Deterministic Backbone Creation in an SINR Network without Knowledge of Location.
- William K. Moses Jr. and Shailesh Vaya, Deterministic Protocols in the SINR Model without Knowledge of Coordinates.
- William K. Moses Jr. and Shailesh Vaya, Achieving dilution without knowledge of coordinates in the SINR model.

TALKS

- Gave a talk at **CSE Doctoral Symposium** hosted by NIIT University, India in September 2017.
- Gave a talk at **Chennai Theory Day 2016**, India in April 2016.
- Gave an invited talk at **XRCI Open 2016**, India in January 2016.
- Presented "Balanced Allocation: Patience is not a Virtue" at **Twenty-Seventh Annual ACM-SIAM Symposium on Discrete Algorithms** (SODA 2016), USA in January 2016.
- Presented "Rational Secret Sharing with Honest Players over an Asynchronous Channel" at **4th International Conference of Network Security and its Applications** (CNSA 2011), India in July 2011.

PROFESSIONAL SERVICE

- Was a student organizer of the Indo-Swiss pre-workshop school on algorithms and combinatorics in association with WALCOM 2014.
- Reviewed papers for ICALP 2016, ICDCN 2016, CALDAM 2016, CALDAM 2017, IC3 2017, CALDAM 2018, and SODA 2018.

RESEARCH & ACADEMIC EXPERIENCE

- **PhD Thesis**   IIT Madras, Chennai
  Guide: Prof. John Augustine

  - Worked on problems related to load balancing, both in the classical setting of balls-into-bins and in the mobile robots setting.
  - In the classical setting, developed algorithm FirstDiff[d] which closely matched the current best algorithm Left[d] in terms of maximum load while removing overhead of remembering bin clustering information.
  - In the mobile robots setting, developed algorithms for both static graphs and dynamic rings to solve the problem of perfect load balancing, which we called "dispersion".

- **Masters Thesis**   IIT Madras, Chennai
  Guide: Prof. C. Pandu Rangan

  - Masters thesis was entitled "Study of Rational Secret Sharing over an Asynchronous Broadcast Channel".
  - Surveyed literature in the field of rational cryptography, specifically in the area of rational secret sharing.
  - Proposed an m-out-of-n rational secret sharing scheme which can function over an asynchronous broadcast channel without the use of cryptographic primitives and with a non-interactive dealer using a small number of honest players.

- **Undergraduate Project** KLCE, Vijayawada
  Guide: Mr. K. Raja Sekhar (Asst. Prof.)

  - Created a Java based application to retrieve and show various information, stored on a MySQL backend, about attack patterns in order to aid web application developers in the assessment of the security of their applications.

WORK EXPERIENCE

- **Intern at Xerox Research Centre India** XRCI, Bangalore
  Mentor: Shailesh Vaya *Aug. 2014 - Dec. 2014*

  - Solved problems of multi-broadcast, wake-up, and backbone creation in Signal-to-Interference-plus-Noise-Ratio (SINR) networks with the help of the interesting combinatorial tool called strongly selective family.
  - Created deterministic algorithms to solve above problems when nodes do not know their own Euclidean coordinates.
  - Also created faster deterministic algorithm to solve backbone creation when nodes do know their neighboring nodes' labels.

TEACHING EXPERIENCE

- Was the **lead** Teaching Assistant for the course Design and Analysis of Algorithms from January - May, 2017. The undergraduate course provides an introduction to the principles of algorithm design and analysis.
- Was a Teaching Assistant for the course Probability and Computing from July - November, 2016. The graduate level course covers those topics of probability useful for algorithms research.
- Was a Teaching Assistant for the GIAN (Global Initiative of Academic Networks) course Distributed Network Algorithms: Foundations and Future Directions in August 2016. The course covers the foundations of distributed network algorithms and also presents the state of the art research being done in the area.
- Was a Teaching Assistant for the MOOC Algorithms for Big Data, offered by NPTEL, from July - September 2016. The course covers the theoretical tools and algorithms behind big data research.
- Was a Teaching Assistant for the course Algorithmic Foundations of Data Science from January - May, 2016. The graduate level course covers various tools and concepts needed to study algorithms in data science.
- Was a Teaching Assistant for the course Advanced Data Structures and Algorithms from July - November 2015. The graduate level course revised advanced data structures and algorithms for students.
- Was a Teaching Assistant for the course Distributed Algorithms from January - May 2015. The graduate level course served to introduce students to the area of distributed algorithms and teach them advanced concepts.
- Was the **Lead Teaching Assistant for the first ever MOOC (massive open online course) offered by NPTEL**. The MOOC was named Programming, Data Structures and Algorithms and was an introductory course program. It ran from March - May 2014.
- Was a Teaching Assistant for the course Advanced Data Structures and Algorithms from July - November 2013. The graduate level course revised advanced data structures and algorithms.
- Was a Teaching Assistant for the course Discrete Mathematics for Computer Science from July - November 2012. The course introduced students to the relevant mathematics needed for computer science.
- Was a Teaching Assistant for the lab, Advanced Programming Lab, from January - May 2011. The lab introduced students to advanced programming with data structures and algorithms.
- Was a Teaching Assistant for the course Computational Engineering from July - November 2009, January - May 2010, and July - November 2010. Dealt with the lab part of the course, which introduced students to the nuances of programming via the programming language C.

PROGRAMMING SKILLS

- Proficient in C/C++ and Java.
- Working knowledge of LaTeX2$_\epsilon$, UNIX Shells, SQL, HTML & CSS, and ASM (8086).
- Comfortable with Linux (Debian, Gentoo, & Debian based) and Windows environments.

RELEVANT COURSEWORK

- ***Theoretical Computer Science:***
  During PG - Distributed Algorithms; Approximation Algorithms (under the banner of Advanced Algorithms); Modern Techniques in Theory of Computation; Computational Geometry; Advanced Theory of Computation; Cryptography (under the banner of Recent Dev. in TCS); Parallel and Randomized Algorithms; Advanced Topics in Design and Analysis of Algorithms; Advanced Data Structures and Algorithms (& Lab).
  During UG - Automata Theory & Formal Languages; Data Structures (& Lab); Design & Analysis of Algorithms; Cryptography & Network Security.
- ***Mathematics:***
  During PG - Mathematical Concepts for Computer Science
  During UG - Discrete Mathematical Structures.
- ***Other Courses in Computer Science (During UG) :*** Digital Logic Design; Object Oriented Programming (& Lab); Computer Organization; File Structures (& Lab); Microprocessors (& Lab); Operating Systems; System Software; Database Management Systems (& Lab); Principles of Programming Languages; Software Engineering (& Lab); Data Communications; Computer Graphics (& Lab); Internet Programming (& Lab); Object Oriented Analysis & Design; Computer Networks (& Lab); Compiler Design; Artificial Intelligence; Advanced Computer Architecture; Data Warehousing & Data Mining; Web Technology.