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# Nikhil Sheoran

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**INTERESTS** Systems, Machine Learning for Systems, Information Security, Computer Networks

**EDUCATION**

**University of Illinois at Urbana-Champaign** Aug 2021 - May 2023 (Expected)
Master of Science in Computer Science Advisor: Prof. Yongjoo Park [Website]

**Indian Institute of Technology, Roorkee, India** Jun 2014 - May 2018
B. Tech in Computer Science, Department Rank 2 CGPA: 9.524 (scale of 10)

**COMPUTER SKILLS**

**Languages**: Python (Highly Proficient), C++, SQL, Bash, Java.
**Web Development**: Django, PHP, JavaScript, HTML, CSS, Apache, Nginx.
**ML Frameworks**: Keras, PyTorch, Tensorflow

**PUBLICATIONS**

S. Shanka*, **N. Sheoran***, S. Mitra. *Scheduling of Time-Varying Workloads in Multi-Tenant Clusters using Deep Reinforcement Learning.* In Proceedings of the Thirty-Fifth AAAI Conference on Artificial Intelligence, AAAI 2021. [AAAI]

**N. Sheoran**, S. Mitra, S. Ghetia, J. Varshney, V. Porwal, T. Mai, A. Rao, V. Madukkuri, L. Mishra. *Predicate-Aware Query Approximation using Generative Models.* Under Review.

A. Sinha, D. Jain, **N. Sheoran**, S. Khosla, R. Sasidharan. *Surveys Without Questions: A Reinforcement Learning Approach.* In Proceedings of the Thirty-Third AAAI Conference on Artificial Intelligence. AAAI 2019. [AAAI]

S. Mitra, S. Shanka, **N. Sheoran**, N. Dhake, R. Nehra, R. Simha. *Learning to Place Applications in a Shared Cluster.* In Proceedings of the 10th ACM SIGOPS Asia-Pacific Workshop on Systems. APSys 2019. [Slides] [ACM]

D. Jain , A. Sinha, **N. Sheoran**, D. Gupta, S. Khosla. *Measurement of Users' Experience on Online Platforms from their Behavior Logs.* In Advances in Knowledge Discovery and Data Mining. PAKDD 2018. [Springer]

**PROFESSIONAL EXPERIENCE**

**Graduate Teaching Assistant** University of Illinois at Urbana-Champaign
*Department of Computer Science* Aug 2021 - Present

- CS240: Introduction to Computer Systems [Course Website]
- Developing auto-grading mechanism for various machine problems (MPs) and guiding students to successfully solve them.
- Conducting weekly office-hours to help students with doubts on lecture content, homework assignments and machine problems.

**Research Associate** Adobe Research, Bangalore, India
*Big Data Experience Lab* Jun 2018 - Aug 2021

- *Scheduling of Time-Varying Workloads in Multi-Tenant Clusters*
  - Deep RL agent for taking scheduling decisions - which job to be placed where.
  - Evaluated on average resource-utilization, fragmentation and over-utilization.
- *Predicate-Aware Approximate Query Processing*
  - Conditional generative model to generate predicate-aware targeted samples.
  - Evaluated query approximation error, latency and memory footprint.
- *Measurement of User's Browsing Experience*
  - Modelled users' behavior on an online platform as a Partially Observed MDP.
  - Evaluated the derived user experience metric against survey scores.
- *Multi-Touch Attribution for B2B Marketing Journeys*
  - Utilized Conversion Prediction as an auxiliary task for deriving attribution scores.
  - Modified LSTM cell state to incorporate time-aware decay.

*Equal Contribution

**GRANTED PATENTS**

**N. Sheoran**, N. Raju, V. Srivastava, N. Golakiya, D. Singal, D. Jain, A. Sinha. *Machine-learning models applied to interaction data for determining interaction goals and facilitating experience-based modifications to interface elements in online environments.* [Google Patents]

A. Sinha, D. Jain, **N. Sheoran**, D. Gupta, S. Khosla. *Machine-Learning Models Applied To Interaction Data For Facilitating Experience-Based Modifications To Interface Elements In Online Environments.* [Google Patents]

S. Kim, D. Jain, D. Gupta, E. Koh, B. Kveton, **N. Sheoran**, A. Sinha, H. Bui, C. Chen *Predictive analysis of target behaviors utilizing RNN-based user embeddings.* [Google Patents]

**PUBLISHED PATENTS**

S. Mitra, **N. Sheoran**, S. Subha, N. Dhake, R. Nehra, R. Simha. *Self-Learning Scheduler for Application Orchestration on Shared Compute Cluster.* [Google Patents]

A. Sinha, D. Jain, **N. Sheoran**, D. Gupta, S. Khosla. D. Jain, A. Sinha, D. Gupta, **N. Sheoran**, S. Khosla, R. Sasidharan. *Characterizing and Modifying User Experience of Computing Environments Based on Behavior Logs.* [Google Patents]

**HONORS & AWARDS**

Awarded **Prime Minister's Scholarship Scheme** 2014-18 for academic performance.
Selected for **KVPY Fellowship Award** 2013
AIR 10 in **ACM ICPC** Chennai On-site Regionals 2016-17
AIR 5 in **Microsoft Build The Shield** Onsite Round 2016
AIR 9 in **Junior Mathematical Olympiad**, KVS 2013

**INTERNSHIPS**

**Research Intern** — Adobe Research, India
*Big Data Experience Lab* — May - June 2017
- Modelled the temporal nature of Users' online browsing behavior through various models - constrained LSTM, Probabilistic Suffix Tree and Hidden Markov Models.
- Proposed the concept of stage-wise experience values and their computation based on user's behavior logs.

**Software Developer Intern** — Scholastic Solutions Pvt. Ltd.
*Remote* — May - June 2015
- Designed trust-score algorithm for a crowd-sourced educational institutions' data listing and verification platform.
- Implemented the algorithm and modules in PHP for the search engine, user profile and system generated answers.

**PROJECTS**

**Distributed Storage Networks with Smart Contracts Incentivisation** [Report]
*Advisors: Dr. Manoj Mishra and Dr. Sugata Gangopadhyay, CSE Dept. IIT Roorkee*
- Proposed a smart contract based storage network incentivized for sharing storage.
- Obtains proof of space (availability of storage) through memory-hard puzzles.

**Forminator**
*Information Management Group, IIT Roorkee*
- Built a data collection and management platform allowing custom form creation.
- Provides ability to limit audience through logical combinations of various campus level student attributes.

**OFFICIAL POSITIONS**

**Chief Coordinator, Information Management Group, IIT Roorkee**
- Led and mentored a group of 50 developers and designers in developing scalable applications supporting approximately 10,000 campus students and faculties.
- Delivered lectures on - Web Development, Information Security and Computer Networks.

**Vice Chair, ACM Student Chapter, IIT Roorkee**
- ACM Student Chapter aims at promoting Computer Science culture in the Campus.
- Coordinated and organized various campus activities like Career Workshops, Guest Lectures and Hackathons.

**Mentor, Student Mentorship Programme, IIT Roorkee**
- Mentored 5 first year undergraduate students for both academic and non-academic affairs.