Nishant Sharma

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EDUCATION

University of Nebraska-Lincoln, Lincoln, Nebraska, USA

- Master of Science (M.S.) in Computer Science — Aug, 2015 – Present
  - Thesis: Rate based Impact Analysis
  - Adviser: Dr. Sebastian Elbaum, Co-adviser: Dr. Carrick Detweiler
  - Focus: Software Engineering, Robotics, Program Analysis.
  - Cumulative GPA: 3.88 / 4.0

Indraprastha Institute of Information Technology, Delhi, India

- Bachelor of Technology (B.Tech.) in Computer Science — Aug, 2011 – May, 2015
  - Thesis: A Multi-Robot Foraging Model on Deciding Predation Risk VS. Food Quality Trade-Offs
  - Advisor: Dr. P. B. Sujit
  - Focus: Swarm Robotics, Navigation, Biomimetics, Cost-Reward Model.
  - Cumulative GPA: 8.61 / 10.00

RESEARCH EXPERIENCE

NIMBUS Lab, University of Nebraska-Lincoln

- Research Assistant — Aug, 2015 – Present
  - Projects: RSIA: Rate Static Impact Analysis, and DRIA: Dynamic Rate Impact Analysis
  - Advisors: Dr. Sebastian Elbaum, and Dr. Carrick Detweiler
  - Focus: Software Testing and Debugging, Dynamic and Static Program Analysis, Robotic Software Systems.

Swarath, Indraprastha Institute of Information Technology

- Research Assistant — Feb, 2015 – July, 2015
  - Project: Developing an autonomous car (Planning and Control Module), for the Mahindra's Spark the Rise Driverless Car Challenge (Qualified for Task Round)
  - Advisors: Dr. P. B. Sujit, and Dr. Sanjit Kaul
  - Focus: Path-Planning, Physical-Model Simulation.

Coral Lab, Indraprastha Institute of Information Technology

- Undergraduate Researcher — Aug, 2013 – May, 2015
  - Project 1: A Multi-Robot Foraging Model on Deciding Predation Risk VS. Food Quality Trade-Offs
  - Advisor: Dr. P. B. Sujit
  - Focus: Swarm Robotics, Navigation, Biomimetics, Cost-Reward Model.
  - Project 2: BugFlood: A bug inspired algorithm for efficient path planning in an obstacle rich environment
  - Advisor: Dr. P. B. Sujit
  - Focus: Path-Planning, Navigation, 2D Offline Planning.

PUBLICATIONS

CONFERENCES

[1] N. Sharma, Parikshit Maini, and P. B. Sujit, "A Multi-Robot Foraging Model on Deciding Predation Risk VS. Food Quality Trade-Offs," in *Robotics and Biomimetics (ROBIO), IEEE International Conference on*, Bali, Indonesia, Dec, 2014.

[2] N. Sharma, Jose Pinto, and P. B. Sujit, "BugFlood: A bug inspired algorithm for efficient path planning in an obstacle rich environment," in *AIAA Infotech @ Aerospace*, *AIAA SciTech Forum*, San Diego, California, USA, Jan, 2016.

UNDER REVIEW

[3] N. Sharma, Sebastian Elbaum, and Carrick Detweiler, "Rate Impact Analysis in Robotic Systems," at *IEEE International Conference on Robotics and Automation, ICRA 2017*.

[4] N. Sharma, S. Thukral, S. Aine, and S.P. Baliyarasimhuni, "A fast path planning algorithm using bug splitting technique," at *IEEE International Conference on Robotics and Automation, ICRA 2017*.

TEACHING EXPERIENCE

Indraprastha Institute of Information Technology, Delhi

- **Teaching Assistant (Robotics)** Jan, 2015 – Apr, 2015
  - Conducted weekly office hours to help students learn better.
  - In collaboration with other TA's: prepared, conducted, and graded weekly labs.
  - Collaborated with the professor and other TA's to help improve grading policies.
- **Teaching Assistant (System Management)** Aug, 2014 – Dec, 2014
  - Conducted weekly labs with simultaneous lab evaluations.
  - Designed and evaluated weekly assignments along with monthly quizzes during the semester.

PROJECTS

University of Nebraska, Lincoln

- **Ringo Robot** Aug, 2016 – Dec, 2016

Implemented a controller and a planner using FreeRTOS for the commercially available educational robot, Ringo.

- **Genetic Algorithm based PID tuning** Jan, 2016 – May, 2016

Used genetic algorithms to develop a solution for the hectic task of PID tuning. Challenges included defining a cost function for the genetic algorithm.

- **Differential Symbolic Execution for ROS** Aug, 2015 – Dec, 2015

Developed an approach to take two versions of a system, and then generate test cases to exploit the modified region(s) using symbolic execution.

- **Compiler Implementation** Aug, 2015 – Dec, 2015

Defined a language ESC-JAVA (a strict subset of java) Developed a compiler of the language including lexer, parser, type checker, byte code generator, and an optimizer.

Indraprastha Institute of Information Technology, Delhi

- **Swarm of GPS-based Navigator Carbot** Aug, 2014 – May, 2015

Developed a swarm of ROS-based ground robots capable of navigating in a closed environment by utilizing inputs from different sensors like GPS, proximity, IR, etc.

- **Saarthi** Jan, 2014 – Apr, 2014

A windows phone-based application having a visual-attention-level monitor for accident prevention and detection using the inbuilt sensors of the phone. The project qualified for the national round of the Microsoft Imagine-Cup, 2014.

- **MobilEye** Jan, 2014 – Apr, 2014

An android application to help visually impaired walk by tracking their motion and providing information about the nearby obstacles using camera inputs.

- **MobIVRS** Aug, 2013 – Dec, 2013

Implementation of an IVR system on an Android platform, which could be used for different purposes like taking surveys, scheduling appointments, or as a personal voice mail server.

- **Optimization of Flyport Firmware** May, 2013 – Dec, 2013

Firmware optimization on Flyport WiFi Module, an embedded system developed to collect sensor data and transmit it to the central server.

SKILLS

- **Programming Languages:** C/C++, C#, Java, Bash, Python.
- **Tools and Technologies:** Robotics Operating System (ROS), Clang/LLVM, OpenCV, MATLAB, FreeRTOS, Android SDK, Windows phone SDK.
- **Programming platforms:** Linux, Windows, Atmega8, Raspberry PI, Beagle Bone Black, Ordroid, Flyport.

AWARDS & SCHOLARSHIPS

- Undergraduate Financial Scholarship (Fee Waiver), IIIT-Delhi Aug, 2011 – May, 2015
- Microsoft Imagine Cup, National Finalist 2015
- Microsoft Imagine Cup, National Finalist 2014

PROFESSIONAL AFFILIATIONS & ACTIVITIES

Institute of Electrical and Electronics Engineers, IEEE

- Member since 2014

Association for Computing Machinery, ACM

- Member since 2015

VOLUNTEER

University of Nebraska, Lincoln

- Judge for the regional ACM Programming Contest — Oct, 2015
  - Evaluated and provided a fair judgment to a total of 40 teams taking part in the competition.

Indraprastha Institute of Information Technology - Delhi

- Alumni Mentor — Dec, 2015 – Present
  - Helping soon to be graduating students of IIIT-Delhi in making better career choices.
  - My work is targeted towards steering them to the right departments or universities based on their research interests.
- Placement preparation team — May, 2015 – Aug, 2015
  - Helped the next graduating batch prepare for the upcoming job fair.
  - Taught them Operating Systems, Database Systems, and Computer Networks.
- B. Tech Tutorship Program — Jan, 2014 – May, 2014
  - Spent at least an hour per week to help freshmen students learn computing concepts.
  - Conducted weekly sessions with 15 freshmen student to help them practice Data-Structure and Algorithms.
- ESYA, Technical festival — Aug, 2011 & Aug, 2012
  - Helped organize the technical festival where the participant count was reaching $\approx$ 10,000.

Pratham, NGO

- Survey and Analysis Team — July, 2012 – Aug, 2012
  - Conducted an educational background survey for children living in poverty-stricken areas of East Delhi, India.
  - Digitalized the survey management and analysis process.

REFERENCES

- **Dr. Sebastian Elbaum**
  Professor at Computer Science and Engineering Department
  University of Nebraska – Lincoln
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- **Dr. Carrick Detweiler**
  Associate Professor at Computer Science and Engineering Department
  University of Nebraska – Lincoln
  220 Schorr Center, 1101 T Street, Lincoln, NE 68588
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- **Dr. Justin Bradley**
  Assistant Professor at Computer Science and Engineering Department
  University of Nebraska – Lincoln
  261 Avery Hall Lincoln, NE 68588
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- **Dr. P. B. Sujit**
  Assistant Professor (ECE)
  Indraprastha Institute of Information Technology, New Delhi
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