

# Saurabh Srivastava

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## Thesis Work

- *As a Doctoral Student*  
Worked under the guidance of **Prof. T.V. Prabhakar** and **Prof. Vinay P. Namboodiri**. The thesis work is titled **Architectural issues with Chatbots**. In particular, it covers issues related to designing, building and deploying chatbots with the help of chatbot-building platforms. The related documents are available [here](#).
- *As an M.Tech Student*  
Worked under the guidance of **Prof. T.V. Prabhakar** in the field of **Software Architectures**. Studied good architectural practices, and mapping of custom architectures to Architectural Styles. Designed a tool called [Archaware2](#), an Eclipse Rich Client Platform Plug-in for documenting architectures using Architectural Styles.

## Research

### Areas of Interest

Software Engineering and Architecture, Chatbots, AI-intensive Systems, Microservices, Building Systems

### Journal Papers

1. Saurabh Srivastava, Sumit Kalra, T.V. Prabhakar. *Defining Chatbots with Contextual Reactive Patterns*. **Submitted to** *Transactions on Pattern Languages of Programming*, 2020, **Springer**
2. Sumit Kalra, T.V. Prabhakar, and Saurabh Srivastava. [An Architectural Roadmap towards building an Alarm Diffusion System](#). *Ingenierie des Systemes d'Information* Vol. 21, No. 4, pp. 11-25, 2018, **IETA**
3. Puneet Gupta, Saurabh Srivastava, and Phalguni Gupta. [An Accurate Infrared Hand Geometry and Vein Pattern based Authentication System](#). *Knowledge-Based Systems* Vol. 103, pp. 143–155, 2016, **Elsevier**

### Conference Papers

1. Saurabh Srivastava and T.V. Prabhakar. [Desirable Features of a Chatbot-building Platform](#). In **2<sup>nd</sup> International Conference on Humanized Computing and Communication (HCCA)**, Virtual Event, USA, 2020. **IEEE**.
2. Saurabh Srivastava, Sumit Kalra and T.V. Prabhakar. [Contextual Reactive Pattern on Chatbot-building Platforms](#). In *Proceedings of 25<sup>th</sup> European Conference on Pattern Languages of Programs (EuroPLO)*, Virtual Event, Germany, 2020. **ACM ICPS**.
3. Saurabh Srivastava and T.V. Prabhakar. [Intent Sets - Architectural Choices for Building Practical Chatbots](#). In *Proceedings of 12<sup>th</sup> International Conference on Computer and Automation Engineering (ICCAE)*, Sydney, Australia, 2020. **ACM ICPS**.
4. Saurabh Srivastava and T.V. Prabhakar. [A Reference Architecture for Applications with Conversational Components](#). In *Proceedings of 2019 IEEE 10<sup>th</sup> International Conference on Software Engineering and Service Science (ICSESS)*, Beijing, China. **IEEE**, 2019.
5. Saurabh Srivastava and T.V. Prabhakar. [Hospitality of Chatbot building Platforms](#). In *Proceedings of 2<sup>nd</sup> SQUADE, at 27<sup>th</sup> ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE)*, Tallinn, Estonia. **ACM**, 2019.
6. Saurabh Srivastava, Vinay P. Namboodiri, and T.V. Prabhakar. [Achieving Privacy-Utility Trade-off in Existing Software Systems](#). In *Proceedings of 2019 International Conference on Advanced Information Systems and Engineering (ICAISE)*, Cairo, Egypt. **IOP Publishing**, 2019. [Best Presentation for the session]

### Technical Reports

1. Saurabh Srivastava, Vinay P. Namboodiri, and T.V. Prabhakar. [PUTWorkbench: Analysing Privacy in AI-intensive Systems](#). arXiv Report, 2019.

2.	Saurabh Srivastava and T.V. Prabhakar. <a href="#">Nubo: A Middleware for interacting with Cloud Platforms</a> . White Paper, 2018.
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## Work Experience

<b>Organization</b>	Indian Institute of Information Technology, Lucknow		
<b>Position</b>	Visiting Faculty		
<b>Job Description</b>	Currently offering the course titled <i>Object Oriented Methodology</i> to B.Tech, 1 <sup>st</sup> year students. Prior to that, I offered courses titled <i>Introduction to Programming</i> to B.Tech, 1 <sup>st</sup> Year students and <i>Advanced Programming Languages</i> to B.Tech, 2 <sup>nd</sup> Year students.		
<b>Duration</b>	October 2020 – Ongoing	<b>(6 months as on 26/3/2021)</b>	
<b>Organization</b>	Illuminate Health Inc., Carmel, Indiana, USA		
<b>Position</b>	Consultant-Architect ( <i>Part time : 6 - 8 Hours per week</i> )		
<b>Job Description</b>	Architecting solutions and providing technical guidance to a team of developers, including overseeing of overall development process as well as deployment		
<b>Duration</b>	July 2018 – March 2020	<b>(1 Year 9 Months)</b>	
<b>Organization</b>	IBM Research - India, Bangalore		
<b>Position</b>	Research Intern		
<b>Job Description</b>	Worked with the <i>SE4AI</i> (Software Engineering for AI) Group on the task of enriching text datasets with additional data making it more holistic for performing any AI activity		
<b>Duration</b>	August 2018 – November 2018	<b>(3 Months)</b>	
<b>Organization</b>	Databorough India Ltd, Lucknow		
<b>Position</b>	Team Leader		
<b>Job Description</b>	Part of a Java Developers Team, responsible for new releases and maintenance of a Re-engineering Tool for IBM <i>i-Series</i> Computers, using Eclipse Platform		
<b>Duration</b>	June 2012 – June 2013	<b>(1 Year 1 Month)</b>	
<b>Organization</b>	RAMPgreen Technologies, Noida		
<b>Position</b>	Software Engineer		
<b>Job Description</b>	Building CRM Products and Web based solutions using Java Technologies, PHP, MySQL, jQuery and other Open Source tools		
<b>Duration</b>	August 2011 – May 2012	<b>(10 Months)</b>	
<b>Organization</b>	Indian Space Research Organization (ISRO) / ISRO Satellite Centre, Bangalore		
<b>Position</b>	Scientist/Engineer- SC		
<b>Job Description</b>	Part of the 9-member team, responsible for the development and maintenance of Ground Support Software, for <b>Health Monitoring</b> and <b>Control of Remote Sensing Satellites</b> , including <b>Chandrayaan – 1</b>		
<b>Duration</b>	September 2007 – July 2009	<b>(1 Year 10 Months)</b>	

## Educational Details

Qualification	College / University	Percentage / CPI	Year
<i>Ph.D. Scholar (CSE)</i>	Indian Institute of Technology, Kanpur	9.5 / 10	2021
<i>M. Tech. (CSE)</i>	Indian Institute of Technology, Kanpur	9.0 / 10	2011
<i>B. Tech. (CSE)</i>	Uttar Pradesh Technical University, Lucknow	74.2 / 100	2007
<i>Intermediate</i>	Delhi Public School, Jagdishpur / CBSE	80.6 / 100	2003
<i>High School</i>	Kendriya Vidyalaya, Jagdishpur / CBSE	80.0 / 100	2001

## Teaching and Seminars

1.	<p>Visiting Faculty at Department of Information Technology, IIT Lucknow. Instructor for the courses:</p> <ul style="list-style-type: none"> <li>• <b>Advanced Programming Language:</b> A course on programming in Java, offered to B.Tech sophomores</li> <li>• <b>Introduction to Programming:</b> A course on programming fundamentals; involving programming with C, offered to B.Tech freshmen</li> <li>• <b>Object Oriented Methodology:</b> A course on fundamentals of Object Oriented Design and Modelling, with programming focus on C++, being <u>currently offered</u> to B.Tech freshmen A YouTube channel where the lectures are available can be reached <a href="#">here</a></li> </ul>
2.	Resources for <a href="#">Invited Academia Talk</a> at titled <b>AI-driven Chatbot Architecture &amp; Design</b> at IIT Jodhpur can be found <a href="#">here</a>
3.	<p>Resources for my talks at <a href="#">TEQUIP-III</a> events at <b>IIT Indore</b> are here:</p> <ul style="list-style-type: none"> <li>• Lecture Slides for the talk titled <b>Deep Learning and Conversational Agents</b> as part of a <b>Short-term Course on Deep Dive in Deep Vision</b> can be found <a href="#">here</a></li> <li>• Resources for talks on <b>Architecting and Designing Chatbots</b> as part of <b>Expert Lectures on Artificial Intelligence and Machine Learning</b> can be found <a href="#">here</a></li> </ul>
4.	<p>Teaching Assistant at Department of Computer Science &amp; Engineering, IIT Kanpur, for the following courses:</p> <ul style="list-style-type: none"> <li>• <b>ESC101 – Fundamentals of Computing:</b> Introductory lab course for B.Tech freshmen, covering basics of Linux Operating Systems, Data Structures and Programming in C</li> <li>• <b>CS251-252 – Computing Laboratory I and II:</b> Lab course for B.Tech sophomores, covering Shell Programming, Version Control Tools, Editing Tools, Networking basics, Web Development basics etc.</li> <li>• <b>CS455 – Software Engineering:</b> Elective course for B.Tech juniors and seniors, covering the Software Development Lifecycle with Term Project and Presentations</li> <li>• <b>CS654 – Software Architecture:</b> Elective course for Graduate Students, covering Software Quality Attributes, Solution Architecture, Architectural Tactics etc. with Term Project and Presentations</li> <li>• <b>CS727 – Topics in Internet Technologies:</b> Elective course for Graduate Students, covering Architecture of the Web, building applications across multiple platforms (such as cloud and mobile phones), decoding architectures of common internet applications etc. with Term Project and Presentations</li> </ul>
5.	<p>Instructor for the course <a href="#">ICT Basics</a> on NPTEL, for <b>Identity Management</b> and <b>Location Recognition</b>. YouTube link for the Lecture on Identity Management – <a href="#">Part 1</a>, <a href="#">Part 2</a> YouTube link for the Lecture on Location Recognition – <a href="#">Part 1</a>, <a href="#">Part 2</a></p>
6.	<p>Invited to deliver a hands-on <a href="#">Workshop</a> at Marathwada Mitra Mandal's College of Engineering (MMCOE), Pune on <b>Building Private Clouds with OpenStack</b>. Slides for the Presentation – <a href="#">[PDF]</a></p>
7.	<p>Invited to deliver a hands-on <a href="#">Workshop</a> at Amity Institute of Information Technology (AIIT), Lucknow on <b>Building Chatbots with Google Dialogflow, IBM Watson Assistant and Amazon Lex</b>. Selected slides for the session – <a href="#">[PDF]</a></p>

## Academic Achievements

1.	Received <b>Academic Excellence Award</b> at IIT Kanpur for excellence in Academic Session 2009-10 (2011)
2.	Secured <b>Rank 1</b> in the batch of <i>M. Tech</i> (2009-2010)
3.	Finished <b>Runners Up</b> from IIT Kanpur in <b>Xerox Research Centre India - Research Innovation Challenge</b> as part of a 3-member team (2014) v
4.	Participated in <b>Microsoft code4bill Coding Contest</b> and successfully made it to the <b>Round 4/Stage II</b> among the <b>Top 1000</b> contestants in India, out of about 20000 participants (2006)

## Technical Skills

<b>Programming</b>	C, C++, Python, Java, JFC Swings, JavaFX, JDBC, Java 2D Graphics, X-Motif, Scilab, SWT, GEF, CUDA, draw2d, ANTLR
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<b>OS/Platforms</b>	Microsoft Windows, Redhat Linux, Fedora, Ubuntu, Eclipse Plug-in Development
<b>Web Designing</b>	HTML, JSP, PHP, JavaScript, jQuery, Adobe Dreamweaver and Fireworks
<b>Databases</b>	MySQL, Oracle 9i, MongoDB

## Internships and Projects

1.	<p>As an Intern at <b>IBM Research</b> (2018)</p> <ul style="list-style-type: none"> <li>• <b>Title:</b> <i>Enrichment of text datasets</i></li> <li>• <b>Description:</b> For datasets containing massive amount of unstructured text, carefully planted variations can change behavior of many Machine Learning activities (such as Sentiment Analysis, Question-Answering, Text Summarization etc.) significantly. We worked on methods to enrich these datasets with many pre-defined operations such as use of synonyms, change of speech, adding common typos etc. The work was part of the larger space of generating valuable test cases to prevent Machine Learning models from failure by providing them more holistic input data for training.</li> </ul>
2.	<p>As a PhD Scholar at <b>IIT Kanpur</b> (2016)</p> <ul style="list-style-type: none"> <li>• <b>Title:</b> <i>Nubo - A Middleware for interacting with Cloud Platforms</i></li> <li>• <b>Description:</b> We intended to propose a Domain-specific Language, which could help developers in creating and managing Virtual Resources such as Virtual Private Clouds, Virtual Machines, Docker Containers etc. The language intended to be fairly similar to any natural language (e.g. English). I built a toy interpreter to showcase the abilities of such a language.</li> <li>• <b>Repository:</b> The toy interpreter's code is available in a public Git repository at: <a href="https://bitbucket.org/ssri5/nubodemointerpreter/">https://bitbucket.org/ssri5/nubodemointerpreter/</a> A white paper explaining the intensions of the language can be found at <a href="https://bitbucket.org/ssri5/nubodemointerpreter/downloads/Nubo_White_Paper.pdf">https://bitbucket.org/ssri5/nubodemointerpreter/downloads/Nubo_White_Paper.pdf</a></li> </ul>
3.	<p>As a part of <b>Work at ISRO</b> (2008-2009)</p> <ul style="list-style-type: none"> <li>• <b>Title:</b> <i>SoeDsp and OpsDir</i></li> <li>• <b>Description:</b> SoeDsp (Sequence of Operations Display) and OpsDir (Operational Directives) were deployed during <b>Chandrayaan-1 Mission</b> at ISRO Telemetry Tracking and Command Centre (ISTRAC) at Bangalore</li> <li>• <b>Usage:</b> The utilities were used to <b>manage the Telecommands</b> (OpsDir) and to <b>view in Real-time</b>, the currently <b>transmitted Telecommands</b> (SoeDsp) to be sent to the satellite</li> </ul>
4.	<p>As a part of <b>Coursework in Advanced Compiler Optimization</b> during <i>M. Tech</i> (2009)</p> <ul style="list-style-type: none"> <li>• <b>Title:</b> <i>Implementation of BLAS-3 Libraries over CUDA platform</i></li> <li>• <b>Description:</b> Use of NVIDIA CUDA (Compute Unified Device Architecture) platform to implement BLAS (Basic Linear Algebra Subprograms) -3 Library for concurrent execution of Matrix Operations</li> </ul>
5.	<p><b>B. Tech. Final Year Project</b> (2007)</p> <ul style="list-style-type: none"> <li>• <b>Title:</b> <i>Frenzomania</i></li> <li>• <b>Description:</b> An <i>Online Social Networking Site</i>, to socialize with family and friends</li> <li>• <b>Technology:</b> <b>JSP, Oracle 9i</b> (including <b>Oracle interMedia</b>, for <i>Graphics Support</i>), <b>Apache Tomcat 5.5</b></li> </ul>
6.	<p><b>Summer Internship</b> (After B. Tech. 3<sup>rd</sup> Year) (2006)</p> <ul style="list-style-type: none"> <li>• <b>Title:</b> <i>Complaint Registration System</i></li> <li>• <b>Organization:</b> Bharat Heavy Electricals Ltd. (BHEL)</li> <li>• <b>Description:</b> Grievance Cell Website designed in <b>JSP</b> and <b>MS Access</b> for Employees to register their complaints, check their status, send reminders etc.</li> </ul>
7.	<p><b>Summer Internship</b> (After B. Tech. 2<sup>nd</sup> Year) (2005)</p> <ul style="list-style-type: none"> <li>• <b>Title:</b> <i>Digital Diary</i></li> <li>• <b>Organization:</b> Uttar Pradesh Development Corporation Ltd. (UPDESCO)</li> <li>• <b>Description:</b> Online Personal Diary designed in <b>JSP</b> and <b>MS Access</b> with facilities for Contacts Management and Reminders</li> </ul>

## Extracurricular Activities

1.	<b>Departmental Placement Coordinator (DPC)</b> (June 2010 – June 2011) <ul style="list-style-type: none"><li>• Representative from CSE Department at the Students Placement Office, IIT Kanpur for the Placement Season 2010-11</li><li>• The role includes interacting with companies and arranging their visits to the campus</li></ul>
2.	Won <b>1<sup>st</sup> Prize</b> in <b><i>Sangharsh 2010</i></b> (Hostel Level Annual Sports Festival) in <b>Table Tennis Doubles</b>
3.	Organized and hosted Farewell and Fresher Parties at both Undergraduate as well as Postgraduate level, participating in Singing and Dramatics