Saurabh Srivastava

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Work Experience

Organization	Indian Institute of Technology (Indian School of Mines), Dhanbad
Position	Assistant Professor, Department of Computer Science & Engineering | Faculty-In-Charge, Automation (Managing Institute's in-house ERP solution) | Co-Faculty-In-Charge, Cyberlabs, NVCTI (Institute's Innovation Centre)
Job Description	Offered the following courses: 1. *Object Oriented Methodology* to B.Tech, 2nd year students 2. *Database Management Systems* to B.Tech, 3rd Year students 3. *Software Engineering* to B.Tech, 3rd Year students 4. *Software Testing* to B.Tech Final Year, M.Tech and Ph.D. students 5. *Building Software Systems* to B.Tech Final Year, M.Tech and Ph.D. students 6. *Introduction to Unix and Software Tools* to B.Tech 1st year students
Duration	June 2021 – Present *(3 Years 7 Months in January 2025)*
Organization	Indian Institute of Information Technology, Lucknow
Position	Visiting Faculty
Job Description	Offered the following courses: 1. *Object Oriented Methodology* to B.Tech, 1st year students 2. *Introduction to Programming* to B.Tech, 1st Year students 3. *Advanced Programming Languages* to B.Tech, 2nd Year students.
Duration	October 2020 – June 2021 *(9 Months)*
Organization	Illuminate Health Inc., Carmel, Indiana, USA
Position	Consultant-Architect *(Part time: 6 - 8 Hours per week)*
Job Description	Architecting solutions and providing technical guidance to a team of developers, including overseeing of overall development process as well as deployment
Duration	July 2018 – March 2020 *(1 Year 9 Months)*
Organization	IBM Research - India, Bangalore
Position	Research Intern
Job Description	Worked with the *SE4AI* (Software Engineering for AI) Group on the task of enriching text datasets with additional data making it more holistic for performing any AI activity
Duration	August 2018 – November 2018 *(3 Months)*
Organization	Databorough India Ltd, Lucknow
Position	Team Leader
Job Description	Part of a Java Developers Team, responsible for new releases and maintenance of a Re-engineering Tool for IBM *i*-Series Computers, using Eclipse Platform
Duration	June 2012 – June 2013 *(1 Year 1 Month)*

Organization	RAMPgreen Technologies, Noida
Position	Software Engineer
Job Description	Building CRM Products and Web based solutions using Java Technologies, PHP, MySQL, jQuery and other open-source tools
Duration	August 2011 – May 2012 *(10 Months)*

Organization	Indian Space Research Organization **(ISRO)** / ISRO Satellite Centre, Bangalore
Position	Scientist/Engineer- SC
Job Description	Part of the 9-member team, responsible for the development and maintenance of Ground Support Software, for **Health Monitoring** and **Control** of **Remote Sensing Satellites**, including **Chandrayaan – 1**
Duration	September 2007 – July 2009 *(1 Year 10 Months)*

Sponsored Projects

Title	*To develop LM based Expert AI agent for Mission Operation Management*
Agency	ISRO / Department of Space
Role	Principal Investigator (PI)
Description	To build a conversational interface for analysing telemetry data for multiple Indian satellites with the help of open-source Large Language Models
Duration	December 2024 – December 2027 *(3 Years)*
Status	Ongoing
Budget	₹ 28,08,462

Title	*Large Language Model for Legal Assistance*
Agency	IIT Mandi iHub & HCi Foundation
Role	Co-Principal Investigator (Co-PI)
Description	To build a solution leveraging Large Language Models for helping users with legal advice
Duration	January 2025 – January 2027 *(2 Years)*
Status	Ongoing
Budget	₹ 15,29,000

Awards

o *Product Development Award for Institute Governance (December 2022)*
Built a distributed Typing Tester Suite with a *Client* utility exposed to a person taking a typing test, and a *Server* utility to configure, control and evaluate the client utilities across multiple workstations. The product was essential to conduct the Typing Test for a recently concluded Recruitment process. Manual conduction, followed by manual evaluation, of nearly 900 candidates that were shortlisted for the same, was a tedious task. The product performed, both conduction as well as the evaluation of the Test, with minimal human intervention.

Research

Areas of Interest

Software Engineering and Architecture, Chatbots, Large Language Models, AI-intensive Systems, Microservices

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,* **IIETA**

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**
4.	*Aditya Dixit, Anup Kumar Gupta, Puneet Gupta, Saurabh Srivastava, and Ankur Garg. UNFOLD: 3-D U-Net, 3-D CNN, and 3-D Transformer-Based Hyperspectral Image Denoising. IEEE Transactions on Geoscience and Remote Sensing Vol. 61, pp. 1–10, 2023,* **IEEE**

Conference Papers

1.	*Saurabh Srivastava and T.V. Prabhakar. Desirable Features of a Chatbot-building Platform. In* **2nd International Conference on Humanized Computing and Communication (HCCAI),** *Virtual Event, USA, 2020.* **IEEE.**
2.	*Saurabh Srivastava, Sumit Kalra and T.V. Prabhakar. Contextual Reactive Pattern on Chatbot-building Platforms. In Proceedings of* **25th European Conference on Pattern Languages of Programs (EuroPLoP),** *Virtual Event, Germany, 2020.* **ACM ICPS.**
3.	*Saurabh Srivastava and T.V. Prabhakar. Intent Sets - Architectural Choices for Building Practical Chatbots. In Proceedings of* **12th 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* **10th 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 2nd* **SQUADE,** *at* **27th** 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. Nubo: A Middleware for interacting with Cloud Platforms. White Paper, 2018.*

Thesis Work

o   *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.

o   *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.

Educational Details

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

Teaching and Seminars

1.	Delivered a day-long workshop titled **Introduction to Conversational AI and Chatbot Architectures** as part of **Five-Day National Workshop on Natural Language Processing for Conversational AI** sponsored by Govt. of Jharkhand at **BIT Mesra, Ranchi**
2.	Instructor at the Executive Program titled **Big Data Analytics: System Design and Development** for Indian Navy organised by **IIT Roorkee**
3.	Delivered a Hands-on Workshop titled **An Introduction to Building Practical Chatbots using DialogFlow, RASA and OpenAI APIs** during Karyashala organised by IIT Indore on "**Synergizing Healthcare Services and Affective Computing using Deep Learning**", sponsored by **SERB** through their Accelerate Vigyan program
4.	Delivered a Hands-on Workshop on **Cloud Computing Technologies** as part of an event organised by the **Continuing Education Centre, IIT Roorkee**
5.	Organised a webinar titled **Emerging Trends in Fundamental Systems Research** (with five invited talks) in collaboration with **Qualcomm India** at **IIT(ISM) Dhanbad**
6.	Organised a seminar titled **Introduction to AI and IBM Watson** at **IIT(ISM) Dhanbad**. Resources for the same can be found here
7.	The list of courses offered as an **Assistant Professor** at the **CSE Department, IIT(ISM) Dhanbad**: • **Database Management Systems** (UG; 2021-22, 2022-23, 2023-24) • **Object Oriented Programming** (UG; 2021-22, 2022-23) • **Software Testing** (PG; 2021-22, 2022-23)
8.	**Visiting Faculty** at Department of Information Technology, IIIT Lucknow. Instructor for the courses: • **Advanced Programming Language:** A course on programming in Java, offered to B.Tech sophomores • **Introduction to Programming:** A course on programming fundamentals; involving programming with C, offered to B.Tech freshmen • **Object Oriented Methodology:** A course on fundamentals of Object Oriented Design and Modelling, with programming focus on C++, offered to B.Tech freshmen A YouTube channel where the lectures are available can be reached here
9.	Resources for **Invited Academia Talk** titled **AI-driven Chatbot Architecture & Design** at **IIT Jodhpur** can be found here
10.	Resources for my talks at **TEQUIP-III** events at **IIT Indore** are here: • Lecture Slides for the talk titled **Deep Learning and Conversational Agents** as part of a **Short-term Course** on **Deep Dive in Deep Vision** can be found here • Resources for talks on **Architecting and Designing Chatbots** as part of **Expert Lectures** on **Artificial Intelligence and Machine Learning** can be found here
11.	Teaching Assistant at Department of Computer Science & Engineering, IIT Kanpur, for the following courses: • **ESC101 – Fundamentals of Computing:** Introductory lab course for B.Tech freshmen, covering basics of Linux Operating Systems, Data Structures and Programming in C • **CS251-252 – Computing Laboratory I and II:** Lab course for B.Tech sophomores, covering Shell Programming, Version Control Tools, Editing Tools, Networking basics, Web Development basics etc. • **CS455 – Software Engineering:** Elective course for B.Tech juniors and seniors, covering the Software Development Lifecycle with Term Project and Presentations • **CS654 – Software Architecture:** Elective course for Graduate Students, covering Software Quality Attributes, Solution Architecture, Architectural Tactics etc. with Term Project and Presentations • **CS727 – Topics in Internet Technologies:** 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
12.	Instructor for the course **ICT Basics** on **NPTEL**, for **Identity Management** and **Location Recognition**. YouTube link for the Lecture on Identity Management – Part 1, Part 2 YouTube link for the Lecture on Location Recognition – Part 1, Part 2

13.	Invited to deliver a hands-on **Workshop** at Marathwada Mitra Mandal's College of Engineering (MMCOE), Pune on **Building Private Clouds with OpenStack**. Slides for the Presentation – [PDF]
14.	Invited to deliver a hands-on **Workshop** at Amity Institute of Information Technology (AIIT), Lucknow on **Building Chatbots with Google Dialogflow, IBM Watson Assistant and Amazon Lex**. Selected slides for the session – [PDF]

Academic Achievements

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

Internships and Student Projects

1.	As an Intern at **IBM Research** (2018) • **Title:** *Enrichment of text datasets* • **Description:** 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.
2.	As a PhD Scholar at **IIT Kanpur** (2016) • **Title:** *Nubo - A Middleware for interacting with Cloud Platforms* • **Description:** 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. • **Repository:** The toy interpreter's code is available in a public Git repository at: https://bitbucket.org/ssri5/nubodemointerpreter/ A white paper explaining the intensions of the language can be found at https://bitbucket.org/ssri5/nubodemointerpreter/downloads/Nubo_White_Paper.pdf
3.	As a part of **Work at ISRO** (2008-2009) • **Title:** *SoeDsp* and *OpsDir* • **Description:** SoeDsp (Sequence of Operations Display) and OpsDir (Operational Directives) were deployed during **Chandrayaan-1 Mission** at ISRO Telemetry Tracking and Command Centre (ISTRAC) at Bangalore • **Usage:** The utilities were used to *manage the Telecommands* (OpsDir) and to *view in Real-time*, the currently *transmitted Telecommands* (SoeDsp) to be sent to the satellite
4.	As a part of **Coursework** in **Advanced Compiler Optimization** during *M. Tech* (2009) • **Title:** *Implementation of BLAS-3 Libraries over CUDA platform* • **Description:** Use of NVIDIA CUDA (Compute Unified Device Architecture) platform to implement BLAS (Basic Linear Algebra Subprograms) -3 Library for concurrent execution of Matrix Operations
5.	**B. Tech. Final Year Project** (2007) • **Title:** *Frenzomania* • **Description:** An *Online Social Networking Site*, to socialize with family and friends • **Technology: JSP**, **Oracle 9i** (including **Oracle *inter*Media**, for *Graphics Support*), **Apache Tomcat 5.5**

6.	**Summer Internship** (After B. Tech. 3rd Year) (2006)
	• **Title:** *Complaint Registration System*
	• **Organization:** Bharat Heavy Electricals Ltd. (BHEL)
	• **Description:** Grievance Cell Website designed in **JSP** and **MS Access** for Employees to register their complaints, check their status, send reminders etc.
7.	**Summer Internship** (After B. Tech. 2nd Year) (2005)
	• **Title:** *Digital Diary*
	• **Organization:** Uttar Pradesh Development Corporation Ltd. (UPDESCO)
	• **Description:** Online Personal Diary designed in **JSP** and **MS Access** with facilities for Contacts Management and Reminders

Technical Skills

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