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IT Experience: January 2003 – Till Date
Teaching Experience (Part-Time): ~12 Years
US Patents Granted: 210+
Research Papers Published: 85+



TRIVIA

I am recognized as one of the Top-10 US Patent Inventors in India of all time:
<https://scholar.google.com/citations?user=IIC2GRUAAAAJ&hl=en>.

EMPLOYMENT HISTORY

- *June 2020 – till date: Accenture Tech Labs, Bangalore, India. Current designation: Technology R&D Senior Principal*
- *Jan 2021 – till date: Adjunct Faculty, Indian Institute of Information Technology (IIIT), Guwahati (Honorary)*
- *May 2007 – June 2020: IBM Research Lab India, New Delhi. Final designation: Senior Research Software Engineer*
- *October 2005 – May 2007: Microsoft India Design Centre, Hyderabad. Final designation: Software Design Engineer*
- *April 2003 – October 2005: VERITAS Software India (Symantec Corporation), Pune. Final designation: Software Engineer.*
- *January 2003 - March 2003: TCS Lab at IIT Bombay under Prof. Pushpak Bhattacharyya (not a TCS employee). Designation: Research Associate.*

QUALIFICATIONS / CERTIFICATIONS

- *Indian Institute of Technology (IIT), Delhi, India, PhD (October, 2019). Thesis title: *Modeling Correlation between Social Connections, Topics and Information Diffusion on Social Media**
- *Indian Institute of Technology (IIT), Mumbai, India, Master of Technology in Computer Science and Engineering (January 2003).*
- *Jadavpur University, Kolkata, India, Bachelor of Engineering in Computer Science and Engineering (June, 2001).*
- *M.S. (Counseling and Psychotherapy), IBMS Chittoor (part-time, 2004).*
- *Senior Diploma in North Indian classical music – Sangeet Prabhakar, Allahabad (part-time, 1990).*

PROFILE / CORE EXPERTISE

My core strength is in blue-sky thinking, ability to produce novel ideas that have led to multiple innovations of major technical significance leading to the incubation of multiple patents and research papers, and architecting and implementing those for significant business benefits.

My academic specialization is in the areas of natural language processing and social network analysis. However, in the profession life, the work has expectedly taken me beyond those boundaries.

In Accenture, I work in the Software Engineering (SE) Research team at Bangalore. My work requires me to invent and innovate beyond traditional boundaries of SE. My present work spans across incubating and delivering several projects (assets, including ownership of all the features within those assets) for Accenture with research challenges spanning over AI, clouds and non-functional computing factors such as computational ecosystem. Some examples of projects I am presently driving include **Enabling Agent-Powered Software Development, Contracts as Graphs** and **LLM/GenAI Control Panels**. Another area I am starting to investigate is **AI Cloud Continuum**.

In the past, in Accenture, I have worked in privacy-preserving computing, hybrid cloud computing, digital twins for clouds, multifactor optimizations for generating hybrid cloud architectures that consider sustainability (green computing), privacy-preservation technologies and regulatory frameworks (GDPR etc.), distributed AI/ML for privacy-preserving cross-client collaborative business intelligence model creation, programmatic creation and strategic execution custom containers, and, hybrid cloud container placement (operational architecture) enablement for sustainable (green) AI creation.

Earlier in IBM Research India, I had worked in social network analysis, cloud compliance, mobile application platform efficiencies, fairness in machine learning and managed infrastructure monitoring. I had been the (first) originator of IBM's mobile money initiative in 2011.

In Microsoft, I had worked on the MSN messenger server. In VERITAS, I had worked on high-availability computation clusters. In TCS Lab (IIT Bombay) under Prof. Pushpak Bhattacharyya as an academic research associate, I had worked on Indo-Aryan (Bengali) Natural Language Processing techniques and algorithms.

SELECTED WORKS:

REFEREED BOOK CHAPTERS

- Garima Chhikara, Ruchika Banerjee, Vinayak Naik, A V Subramanyam and Kuntal Dey. *Use of Facial Landmarks for Adaptive Compression of Videos on Mobile Devices*. Book Title: *LNCS Proceedings on COMSNETS 2018 Highlights*. Publisher: *Springer*. October 2018.
- Venkatraman Ramakrishna and Kuntal Dey. *Mobile Application and User Analytics*. Book Title: *Mobile Application Development, Usability, and Security*. Publisher: *IGI Global*. December 2016.

BOOK CHAPTERS BY INVITATION

- Two contributed chapters on Natural Language Processing: (a) *Introduction to NLP* and (b) *Advanced NLP with Deep Neural Networks* in the book titled *Artificial Intelligence* by Prof. Saroj Kaushik. Publisher: Cengage. October 2021.

TUTORIALS

- Rachel K. E. Bellamy, Kuntal Dey, Michael Hind, Samuel C. Hoffman, Stephanie Houde, Kalapriya Kannan, Pranay Lohia, Jacquelyn Martino, Sameep Mehta, Aleksandra Mojsilović, Seema Nagar, Karthikeyan Natesan Ramamurthy, John T. Richards, Diptikalyan Saha, Prasanna Sattigeri, Moninder Singh, Kush R. Varshney, Dakuo Wang, Yunfeng Zhang. *Hands-On Tutorial: AI Fairness 360*. ACM FAT*. January 2019.

PUBLICATIONS

I have 85+ publications across conferences and journals. A few representative publications spanning over the past decade are the following.

Conference/Journal Papers

1. Seema Nagar, Kalyani Naik, Ferdous Ahmed Barbhuiya, Kuntal Dey. *Exploring the prevalence of homophily among classes of hate speech*. *Social Network Analysis and Mining*, 14(1): 138, 2024
2. Samdyuti Suri, Sankar Narayan Das, Kapil Singi, Kuntal Dey, Vibhu Saujanya Sharma, Vikrant Kaulgud. *Software Engineering Using Autonomous Agents: Are We There Yet?* *Automated Software Engineering ASE (1855-1857)*, September 2023.
3. Manish Ahuja, Narendranath Sukhavasi, Swapnajeet Choudhury, Kaushik Amar Das, Kapil Singi, Kuntal Dey, Vikrant Kaulgud. *MCDFA Framework for Edge-Aware Multi-Cloud Hybrid Architecture*. *Automated Software Engineering ASE 137:1-137:2*, October 2022.
4. Karanbir Chahal, Manraj Singh Grover, Kuntal Dey. *A Hitchhiker's Guide On Distributed Training of Deep Neural Networks*. *Journal of Parallel and Distributed Computing* 137: 65-76, March 2020.
5. Aniya Aggarwal, Pranay Kumar Lohia, Seema Nagar, Kuntal Dey, Diptikalyan Saha. *Black box fairness testing of machine learning models*. *ESEC/SIGSOFT FSE: 625-635*, August 2019.
6. Karan Ahuja, Rahul Islam, Varun Parashar, Kuntal Dey, Mayank Goel, Chris Harrison. *EyeSpyVR: Eye Sensing using Commodity Smartphone-Based VR Headsets*. *Ubicomp*, November 2018.
7. Kuntal Dey, Ritvik Shrivastava, Saroj Kaushik. *Topical Stance Detection for Twitter: A Two-Phase LSTM Model Using Attention*. *ECIR*, March 2018.
8. Abhijit Mishra, Srikanth G Tamilselvam, Riddhiman Dasgupta, Seema Nagar, Kuntal Dey. *A Cognition Cognizant Sentimental Education: Document Level Sentiment Analysis Using Multitask Subjectivity Summarization based on Annotator's Gaze Behavior*. *AAAI*, February 2018.
9. Abhijit Mishra, Kuntal Dey and Pushpak Bhattacharyya. *Learning Cognitive Features from Gaze Data for Sentiment and Sarcasm Classification using Convolutional Neural Network*. *ACL*, July 2017.
10. Karan Ahuja, Rahul Islam, Ferdous A. Barbhuiya and Kuntal Dey. *Convolutional Neural Networks for Ocular Smartphone-Based Biometrics*. *Pattern Recognition Letters*, 91(17-26), May 2017.
11. Abhijit Mishra, Diptesh Kanojia, Seema Nagar, Kuntal Dey and Pushpak Bhattacharyya. *Scanpath Complexity: Modeling Reading Effort Using Gaze Information*. *AAAI*, February 2017.
12. Kuntal Dey, Ritvik Shrivastava, Saroj Kaushik. *A Paraphrase and Semantic Similarity Detection System for User Generated Short-Text Content on Microblogs*. *COLING*, December 2016.

PATENTS / PATENT FILINGS

200+ granted US inventions makes me one of the top-10 in terms of number of US patents held while working from India. The complete list can be found on the USPTO website by using the following query (URL): <https://ppubs.uspto.gov/pubwebapp/external.html?db=USPAT&q=%28A%20OR%20B1%20OR%20B2%29.a.t.%20AND%20%28Kuntal-Dey%20OR%20Dey-Kuntal%29.in>.

10 randomly titles chosen in no particular order are listed below.

1. Value-Based Replication of Streaming Data
2. Microservice Placement in Hybrid Multi-cloud Using Graph Matching

3. Determining a Recommended Hybrid Cloud Computing Environment for an Application On-Demand
4. Defining Redundant Array of Independent Disks Level for Machine Learning Training Data
5. Image Storage Across Distributed Computing Systems
6. Sensitivity-Based Database Processing and Distributed Storage
7. Trait-Modeled Chatbots
8. Corpus Data Augmentation and Debiasing
9. Ordering Annotation Sets for Machine Learning
10. Assignment of Robotic Devices Using Predictive Analytics

WORK EXPERIENCE

**Technology R&D Senior
Principal, Accenture Tech Labs
India, June 2020 – Till date**

In Accenture Labs India, I am a part of the Software Engineering group. I presently work in Enabling Agent-Powered Software Development, Contracts as Graphs and LLM/GenAI Control Panels. Another area I am starting to investigate is AI Cloud Continuum. In the past here, I have seeded and established the technical direction of the privacy-preserving computing here, and have also worked in hybrid cloud architecture generation/creation optimizing for several factors such as privacy, GDPR and sustainability, have worked digital twins for hybrid cloud operation testing and analytics, intelligent creation and migration of containers for hybrid cloud operation optimizations, and cloud container management techniques for enabling sustainable AI. I have led and co-led these projects for implementation, and have been the thought and ideation leader in each of these works.

**Senior Research Software
Engineer – IBM Research India,
May 2007 – June 2020**

In IBM Research India, I had played key research and technical roles in social network analysis, graph theory, graph databases, social media analysis, machine learning fairness large (billion) scale data analysis and end-to-end application lifecycle analysis with performance enhancements. I had also been involved in designing, architecting, developing and enhancing mobile application platforms with high performance, including cloud enablement, as well as end-to-end mobile application analytics system under client-server settings. I had worked in perception-based cognitive computing and applications of artificial intelligence such as in natural language processing and computer vision. I had also worked on bias and fairness of machine learning algorithms and data. I had technically led information extraction and mapping as part of using AI for IT Compliance.

In the later part of my IBM Research career, I had mostly focused on unstructured information-based research (mostly NLP but not limited to it), both within IBM as well as in collaboration with external university faculty and students. I had worked extensively on Fairness (Bias) in data and AI/ML systems/algorithms, and had also been the technical lead of a project on extracting and understanding information from regulatory documents, such as GDPR, HIPAA, PCI-DSS, NIST etc., for the purpose of creating NLP-driven mapping between regulatory document pairs, and further mapping them into organizational IT infrastructure for assessing and assuring AI-driven regulatory compliance.

**Software Developer, Microsoft
India Development Centre, MSN
Messenger Server, Oct 2005 –
May 2007**

Microsoft Network Live Messenger (MSN Messenger) is an instant messenger system used to exchange messages in real time by millions of users across the world. The messenger system is architecturally a combination of a front end client and a backend server system. It has the capability to federate its public messaging backbone to the instant messaging platform of Microsoft Live Communication Servers to enable enterprise employees to communicate seamlessly with external clients.

I was responsible for designing and developing multiple components of messenger server for monitoring the service health of server components as well as develop the business desk framework to implement the capability of integrating with the federation system. The business impact of this development was significantly high, accounting for increase of

process efficiency by well over 500% in an average setting and 900% in the best-case setting.

Software Developer, VERITAS Software India (Symantec Corporation), New Products Initiative on VERITAS Cluster Server, April 2003 – Oct 2005

I worked with the New Products Initiative addressing VERITAS Cluster Server to envision and implement cutting edge prototypes and set futuristic roadmaps for development of the high availability cluster server. I also worked on overriding competition availability clustering policies to leverage OS capabilities such as the Microsoft Clustering Service platform by the VERITAS Clustering policy engine. I had further worked to create a virtual environment that was capable of monitoring live processes, taking deep snapshots of those processes and restoring the process from its actual point of run including system resources on different machines with the same operating system as the machine on which the snapshot was taken (Linux and Solaris).

Research Associate, Tata Consultancy Software Lab, Indian Institute of Technology, Bombay, Jan 2003 – March 2003

I implemented an Artificial Intelligence-based knowledge discovery and synthesis system on the Bengali language using the Universal Networking Language rule framework.

COMMUNITY SERVICES

I have been a reviewer and/or program committee (PC) member in many reputed conferences and journals over many years in the past, such as ACL, EMNLP, NAACL, COLING, EACL, LREC, IJCNLP, Pattern Recognition Letters Journal, AAI, IJCAI, ICPR, ECIR, IEEE Access, IEEE Journal of Biomedical and Health Informatics, and others. Of late, I have consciously reduced my PC/reviewer activities, and at present I am on a break, with an aim to restart in 2026 but with a much-reduced workload. Presently, I act as an Area Chair in ACL Rolling Reviews (area chair for conferences such as ACL and EMNLP), but have voluntarily opted out of other review activities.

I had been the Technical Committee Lead for Invention Disclosure evaluation in IBM Research India across all the disciplines, in 2016 and 2017. In my career, I have led the technical review of 300+ invention disclosures (within my organization) and have participated as a reviewer for a total of 500+ invention disclosures.

I had been an active member of SC 42 (<https://www.iso.org/committee/6794475.html>) for the period 2018-2020. This is the prestigious committee that internationally set the standards for Artificial Intelligence. Here, I had been a part of the committee that governs India's standards and stance towards Artificial Intelligence, both inside India, as well as internationally to the world, on behalf of the Government of India.

I have delivered numerous technical talks in different universities, including IITs and IIITs and other universities, as well as several research conferences.

I have participated in the Board of Senate meetings for several universities such as Indian Institute of Information Technology, Guwahati and Atal Bihari Vajpayee Indian Institute of Information Technology and Management, Gwalior.

AWARDS AND RECOGNITIONS

1. Recognized as one of the Top-10 US Patent Inventors in India of all time: <https://scholar.google.com/citations?user=IIC2GRUAAAAJ&hl=en>.
2. Selected as one of the 200 Heidelberg Laureates Forum Young Researchers in 2019.
3. IBM Master Inventor: 2015 till I moved on from IBM in June 2020.
4. IBM Member of Academy of technology: 2018 till I moved on from IBM in June 2020.

5. Outstanding Technical Achievement Award (OTAA), 2020, for contributions to IBM Trustworthy AI, and 2016, for contribution to the IBM Social Network Analyses projects that won an O-level Science Accomplishment Award.
6. Microsoft spontaneous reward for outstanding contributions to MSN MEssenger in 2006.

TEACHING EXPERIENCE

- A. Currently: Adjunct Faculty (rank: Professor), Indian Institute of Information Technology (IIIT), Guwahati (Honorary, by Invitation, 2021 – Till Date)
- B. South Asian University, New Delhi (July 2013 – December 2013)
- C. EMPI B-School (July 2009 – November 2013, with intermediate semester breaks)
- D. Jamia Hamdard University, New Delhi (July 2012 – September 2012)
- E. Symbiosis Institute of Computer Studies and Research (November 2003 – September 2005 with intermediate semester breaks)
- F. TA-ship in IIT Bombay (July 2001 – December 2002)

STUDENT ADVISING EXPERIENCE

I have advised multiple students in the past for their Bachelors and Masters degrees and continue to do so, in collaboration with the Universities. I am also actively advising 3 PhD students at the moment, in IIIT Guwahati.

OTHER EXPERIENCES AND INTERESTS

Will be shared on request. Other primary areas of expertise and interest (outside Computer Science) are in the areas of psychology, literature and music.