CV last updated: November 10, 2021 Latest CV available at: http://kuntaldey.com/KuntalDey_CV_Academic.pdf

Name: Kuntal Dey

Highest Degree: PhD

Courtesy Title: Dr., Prof.

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Contact Number: +91-9871388275

IT Experience: January 2003 – Till date

Teaching Experience (Part Time): ~8 years

USA Patents Granted / Filed: 140+/~200

Research Papers Published: 75+

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. 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 multiple patents and research papers, and architecting and implementing those ideas for tangible business benefits.

My academic specialization was 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 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, I had worked in social network analysis, cloud compliance, mobile application platform efficiencies, fairness in machine learning and managed infrastructure monitoring. I had been one of the originators of IBM's mobile money initiative also.

In Microsoft, I had worked on their 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.

REFEREED BOOK CHAPTERS

1. 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.
2. 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

3. 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

4. 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

As of now, I have 75+ publications across conferences and journals. A few relatively prominent publications in the past are the following.

Conference/Journal Papers

5. 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.
6. Rachel K.E. Bellamy, Kuntal Dey, Michael Hind, *et al*. *AI Fairness 360: An extensible toolkit for detecting, understanding, and mitigating unwanted algorithmic bias*. IBM Journal of Research and Development 63(4/5): 4:1 – 4:15, 2019.
7. 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.
8. Karan Ahuja, Rahul Islam, Varun Parashar, Kuntal Dey, Mayank Goel, Chris Harrison. *EyeSpyVR: Eye Sensing using Commodity Smartphone-Based VR Headsets.* Ubicomp, November 2018.
9. Kuntal Dey, Ritvik Shrivastava, Saroj Kaushik. *Topical Stance Detection for Twitter: A Two-Phase LSTM Model Using Attention.* ECIR, March 2018.
10. 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.
11. 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.
12. 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.
13. Aanand Nayyar, Utkarsh Dwivedi, Karan Ahuja, Nitendra Rajput, Seema Nagar and Kuntal Dey. *OptiDwell: Intelligent Adjustment of Dwell Click Time*. IUI, March 2017.
14. Abhijit Mishra, Diptesh Kanojia, Seema Nagar, Kuntal Dey and Pushpak Bhattacharyya. *Scanpath Complexity: Modeling Reading Effort Using Gaze Information.* AAAI, February 2017.
15. 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

As of now, I have a total of 200 patent inventions, where 140+ are granted, some under process, and some have been rated file by my employer. A few randomly chosen ones among these are listed below. All of these are filed in the US Patents and Trademarks Office (USPTO). In addition, there have been a large number of technical threads that I had been involved in, and many potential patent filings are extremely likely to emerge out of my past work that IBM might, at its own discretion, choose to pursue.

1. Soujanya Soni, Kuntal Dey, Jhilam Bera. *Message Analysis for Information Security.*
2. Janardan Mishra, Kuntal Dey, Vikrant Kaulgud, Sanjay Podder, Neville Dubash. *Dynamic Competency Estimation through System Behavior Profiling.*
3. Kuntal Dey. *System and Method for Session-Based Assisted Medical Outpatient Billing.*
4. Shikhar Kwatra, Kuntal Dey, Seema Nagar, Craig Tim. *Dynamic Micro-Insurance Premium Value Optimization using Digital Twin Based Simulation.*
5. Kuntal Dey, Seema Nagar, Swati Rallapalli, Vijay E. *System and Methods for Obtaining Real-Time Prices by Shaking Retail Smart-Price-tags.*
6. Kuntal Dey, Seema Nagar, Roman Vaculin. *System and Method for Dynamic Ad Auctioning for Remarketing based upon Reader's Eye Reaction to In-Content Prior Ads in an Online Reading Scenario and System and Method for Enabling Dynamic Updating of Ads on a Web page in a Reading Session Based on Reader's Evolution of Interes*t.
7. Kuntal Dey, Seema Nagar, Roman Vaculin, Karan Ahuja. *System and Method for Performing User Attention Based Digital Remarketing in a Cross-Device, Cross-Channel Scenario.*
8. Kuntal Dey, Sudhanshu Singh, Seema Nagar, Roman Vaculin. *System and Method for Monitoring the Evolution of Cognitive State of Employees to Recommend Taking a Break / Holiday from Work.*
9. Kuntal Dey, Karan Ahuja, Seema Nagar, Roman Vaculin. *System and Method for Tracking Gaze Using Only A Monocular (Single) Camera from a Moving (Changing Angle and Distance) Mobile/Tablet Without User Intervention and Screen Re-Mapping.*
10. Kuntal Dey, Karan Ahuja, Seema Nagar, Roman Vaculin. *System and Method for Performing User Attention Based Physical Remarketing in a Cross-Device, Cross-Channel Scenario.*
11. Kuntal Dey, Nizar Lethif, Saritha Arunkumar, Enara C Vijil. *System and Method for Delivering Personalized / Group-Personalized Advertisements on A Dynamically Changing Number of Devices of Different Capabilities Nearby to Different Sub-Groups, using Split-Merge.*

12. Kuntal Dey, Seema Nagar, Sai Kolluri, Karan Ahuja, Ruchika Banerjee. *System and Method for Creating Shoppers Gaze, Implicit Interest, Identity and Social Network Based Information Disbursement System & Combo Deals.*
13. Kuntal Dey, Seema Nagar, Roman Vaculin. *System and Method for Serving From-Drone Ads using Locally Sampled Keyword Listening.*
14. Kuntal Dey, Karan Ahuja, Seema Nagar, Roman Vaculin. *System and Method for Eye Gaze Estimation With Respect to a Moving Plane where the Camera is Constant (Fixed) With Respect to the Screen.*
15. Kuntal Dey, Seema Nagar, Vijay E, Swati Rallapalli. *Cognitive Personalized Retail Price tags based on shake signature.*
16. Kuntal Dey, Sudhanshu Sekhar Singh, Munish Goyal, Qin S. Held. *System and Method for Predicting Enterprise Emotional Health and Employee Productivity/Churn Risk from Speech Emotions and Ambient Noise in an Enterprise Scenario.*
17. Kuntal Dey, Nizar Lethif, Saritha Arunkumar, Enara C Vijil. *System and Method for Person Identification Using Action Sequencing by Fixed Sensors.*
18. Kuntal Dey, Heena Bansal, Karan Ahuja, Seema Nagar, Roman Vaculin. *System and Associated Methods for Pre-Cooling (Air-Conditioning) Event Venues based on Predictive Crowd Estimation from Social Network Intent Mining.*
19. Kuntal Dey, Heena Bansal, Karan Ahuja, Seema Nagar. *System and Associated Methods for Pre-Cooling (Air-Conditioning) Public Transport Vehicles Running on Fixed Routes using Predictive Crowd Estimation Techniques.*
20. Kuntal Dey, Nizar Lethif, Saritha Arunkumar, Enara C Vijil. *System and Method for Controlling and Altering Biological and Idiosyncratic "Passwords"/Authentications.*
21. Kuntal Dey, Seema Nagar, Srikanth G Tamilselvam, Enara C Vijil. *System and Method for Automatically Suggesting Good Time Points to Click Photos, Suggest Contextual Captions and Upload to Appropriate/Contextual Social Networking Platforms and Groups.*
22. Kuntal Dey, Utkarsh Dwivedi, Karan Ahuja, Seema Nagar, Roman Vaculin. *System and Method for Stateful Instruction-Based Dynamic Man-Machine Interactions for Humanness Validation Using Gaze and Emotion.*
23. Kuntal Dey, Seema Nagar, Sudhanshu Singh, Roman Vaculin. *System and Method for Rearrangement of CV Content Based Upon Reader Cognition.*
24. Kuntal Dey, Seema Nagar, Sudhanshu Singh, Enara C Vijil. *System and Method to Assist Smart Phone/Camera Users to Contextually Focus/Zoom Lens View to Select Event Celebrities.*
25. Kuntal Dey, Seema Nagar, Sudhanshu Singh, Roman Vaculin. *System and Method for Remarketing Advertised CVs within Groups*.

WORK EXPERIENCE

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

Currently in Accenture Tech Labs, I am a part of the Application (Software) Engineering group. I 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, 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.

SOFTWARE SKILLS

Operating Systems	: UNIX (Linux and some Solaris), Windows.
Languages	: C, C++, Java & JS, Linux Shell, HTML, Python, PHP
Languages (exposure)	: C#, Powershell, JSP, ASP, VB
Others	: DBMS, Deep Learning, ML, NLP & Vision tools etc.

AWARDS AND RECOGNITIONS

I am and have been a reviewer and/or program committee member in many reputed conferences and journals. Some examples include COLING 2016, NAACL 2019, LREC 2018, Pattern Recognition

Letters Journal 2016-17, IJCAI 2016, IJCAI 2019 (to be), ECIR 2019, IEEE Access, IEEE Journal of Biomedical and Health Informatics, etc.

AWARDS AND RECOGNITIONS in IBM

1. IBM Master Inventor: 2015 till I moved on from IBM in June 2020
2. IBM Member of Academy of technology: 2018 till I moved on from IBM in June 2020
3. Outstanding Technical Achievement Award (OTAA), 2020, for contributions to IBM Trustworthy AI.
4. Outstanding Technical Achievement Award (OTAA), 2016, for contribution to the IBM Social Network Analyses projects that won an O-level Science Accomplishment Award.
5. Nominated and have been successfully maintaining the title of IBM Master Inventor, for having invented many high value intellectual property, filed as patents in the United States Patent and Trademarks Office (USPTO), in and since 2015.
6. Selected as a Member of the IBM Academy of Technology in 2018.
7. IBM Manager's Choice Award (2014, 2017, 2018, 2019)

TEACHING EXPERIENCE

A. Currently: Adjunct Faculty (rank: Professor), Indian Institute of Information Technology (IIIT), Guwahati (Honorary, by Invitation)
B. TA-ship in IIT Bombay (July 2001 – December 2002)
    1. Introduction to computer programming (FORTRAN) (B.Tech 1st Year)
    2. *Digital Circuits* laboratory (B.Tech 2nd Year)
    3. Computer Organization (B.Tech 2nd Year)
    4. 8085/8086 Programming (B.Tech 3rd Year)
C. Symbiosis Institute of Computer Studies and Research (November 2003 – September 2005 with intermediate semester breaks)
    1. Database Management Systems (M. Sc in Computer Applications)
    2. Algorithms (M. Sc in Computer Applications)
D. EMPI B-School (July 2009 – November 2013, with intermediate semester breaks)
    1. Non-Conventional Research (PGDM 2nd Year)
    2. Web Presence and Analytics (PGDM 2nd Year)
E. Jamia Hamdard University, New Delhi (July 2012 – September 2012)
    1. Artificial Intelligence (MCA Final Year)
F. South Asian University, New Delhi (July 2013 – December 2013)
    1. Mobile Computing (MSc Final Year)

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.

HONORARY MEMBERSHIPS AND ACTIVITIES

I had participated in the Board of Senate, at Atal Bihari Vajpayee Indian Institute of Information Technology and Management, Gwalior, in 2017.

I had been 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, conferences and other universities.

Highlight Achievements while Employed in IBM Research India

To the best of my knowledge, the sum total (count) of file-rated/filed/granted patents plus research papers that I had accrued while in IBM Research India, was the highest ever in the history of the lab, since its inception till the date I had resigned from IBM in June 2020.

I had led the IBM Research India Patent disclosure evaluation committee, for the whole of the research lab, co-leading from Jan 2017 to mid-2018, and individually leading mid-to-end 2018. I led the evaluation more than 400 patent disclosures in IBM, which was by far the highest ever in IBM Research India by anyone, ever, from the inception of the lab till the time I worked in IBM.

PC/Reviewer Activities

I have reviewed and keep actively reviewing for numerous leading computer science conferences and journals. Some of the fora where I regularly review / have reviewed in the recent past are ACL, IJCAI, AAAI, COLING, EACL, NAACL, EMNLP, ECIR, LREC, Pattern Recognition Letters (Journal), and so on.

OTHER EXPERIENCES AND INTERESTS

Will be shared on request. Primary areas of expertise and interest are around psychology, literature and music.