# Sounak Sadhukhan

**B.Tech (Computer Science & Engg.), M.E. (Software Engg.), Ph.D. (Software Engg.)**

Assistant Professor at Bennett University, Noida, UP

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## Work Experience

### Assistant Professor, 08/2024 – Present

**School of Computer Science Engineering and Technology, Bennett University, Noida**

**Roles:** Teaching & Research.

**Description:**

- Currently serving as a faculty member at Bennett University, teaching courses such as Machine Learning and Design & Analysis of Algorithms.
- Delivering lectures, conducting practical sessions, developing assignments, evaluating students, grading, and providing research and academic mentorship.

### Senior Associate, 08/2022 - 08/2024

**PricewaterhouseCoopers LLP India**

**Roles:** Data Scientist.

**Description:**

- Applied advanced machine learning techniques to demand forecasting and supply chain projects, enhancing decision-making and operational efficiency.
- Developed predictive models for proactive resource allocation and inventory management across diverse industries.
- Conducted data analysis using statistical and ML methods to generate actionable insights.
- Collaborated with cross-functional teams to align data-driven strategies with business goals and industry best practices.

### Project Linked Person, 12/2015 – 03/2017

**Indian Statistical Institute Kolkata**

**Project:** Development of risk analytics towards multidisciplinary big data study of humanitarian logistics for disaster response.

**Roles:** Research and development.

**Description:**

- Provide an optimize solution for the shelter allocation and relief distribution in flood scenarios.
- An analytics dashboard visualization was developed for a flood decision support system based on the risk profile of different zones in Kolkata.
- Showed that social media mining can help to produce a better disaster management plan in post-disaster situations.

### Senior Research Fellow, 07/2014 – 12/2015

**Indian Institute of Technology Kharagpur**

**Project:** AI-driven traffic prediction and signaling system.

**Roles:** Research and development.

**Description:**

- Anomalies are being identified for incident detection on highways in India through the analysis of historical traffic data and statistics.
- Statistical inference drawn from historical data and real-time traffic data is used to predict various types of incidents in real-time situations.

### Project Linked Person, 09/2013 – 01/2014

**Indian Statistical Institute Kolkata**

**Project:** Development of robust document image analysis and recognition system for printed Indian script.

**Roles:** Research and development.

**Description:**

- Developed a splay tree data structure to efficiently identify character recognition errors by checking each word in the dataset.

### Software Engineer, 05/2009 - 05/2010

**Hewlett Packard Globalsoft Pvt. Ltd.**

**Roles:** Software Developer.

**Description:**

- Worked on a Teradata EDW space remediation project in the telecom sector to optimize over 14TB of data across 50+ interfaces.
- Analyzed ETL usage, identified unused objects and staging layers, and redesigned SQL processes to improve space efficiency.
- Developed a phased strategy and implemented delta-based data loading patterns to reduce database storage requirements significantly.

# Educational Background

**2022** Doctor of Philosophy

**Department of Computer Science, Institute of Science, Banaras Hindu University, Varanasi, UP**

**Thesis title:** Mathematical and Computational Modelling of Tumour Growth, Cancer Cell Motility and Metastasis

**2013** Master of Engineering (1st Div.)

**Department of Information Technology, Jadavpur University, Kolkata, WB**

**2008** Bachelor of Technology (1st Div.)

**West Bengal University of Technology, Kolkata, WB**

# Academic Achievements

- UGC-NET SRF at Dept. of Computer Science, Banaras Hindu University (May 2019 – January 2022).
- UGC-NET JRF at Dept. of Computer Science, Banaras Hindu University (May 2017 – May 2019).
- MHRD GATE scholarship during M.E. in Dept. of Information Technology, Jadavpur University (August 2011- July 2013).

# Research Area

- The research is broadly categorized under Mathematical Oncology, with a focus on the modeling of cancer progression and therapeutics.
- Mathematical and computational models, supported by theoretical biology, machine learning, and deep learning techniques, are developed to investigate tumor growth dynamics, microenvironment interactions, and treatment responses.
- Multi-scale hybrid models are designed to support non-invasive, patient-specific treatment planning through the integration of clinical data, biomarkers, and medical imaging, thereby contributing to precision medicine and optimized therapeutic strategies.

# List of Publications

- ## Peer-reviewed Journals

1. **Sadhukhan, S.*** & Mishra, P. K. (2022). "Multi-scale agent-based model for tumour cell invasion." **Medical & Biological Engineering & Computing**, 60, 1075–1098.
2. **Sadhukhan, S.*** & Mishra, P. K. (2021). "The Notion of Fractals in Tumour Angiogenic Sprout Initiation Model Based on Cellular Automata." **Chaos, Solitons & Fractals**, 155, 111717.
3. **Sadhukhan, S***, Mishra, P. K., Basu, S. K., & Mandal, J. K. (2021). "A multi-scale agent-based model for avascular tumour growth." **Biosystems**, 206, 104450.
4. **Sadhukhan, S.***, & Basu, S. K. (2020). "Avascular tumour growth models based on anomalous diffusion." **Journal of Biological Physics**, 46, 67-94.
5. Mollah, A. K., **Sadhukhan, S.***, Das, P., & Anis, M. Z. (2018). "A cost optimization model and solutions for shelter allocation and relief distribution in flood scenario." **International Journal of Disaster Risk Reduction**, 31, 1187-1198.
6. Saha, S., Shekhar, S., **Sadhukhan, S.***, & Das, P. (2018). "An analytics dashboard visualization for flood decision support system." **Journal of Visualization**, 21, 295–307.

- ## Conference Proceedings

1. **Sadhukhan, S.***, Basu, S. K., & Kumar, N. (2019). "A continuum model and numerical simulation for avascular tumor growth." **In International Conference on E-Business and Telecommunications (ICETE 2019), Learning and Analytics in Intelligent Systems, vol 3. Springer, Cham.**, (pp. 57-65).
2. **Sadhukhan, S.***, Basu, S. K., & Kumar, N. (2019). "A continuum model and numerical simulation for avascular tumor growth." **In International Conference on E-Business and Telecommunications (ICETE 2019), Learning and Analytics in Intelligent Systems, vol 3. Springer, Cham.**, (pp. 57-65).
3. Santra, D.,**Sadhukhan, S.***, Basu, S. K., Das, S., Sinha, S., & Goswami, S. (2019). "Scheme for unstructured knowledge representation in medical expert system for low back pain management." **In Smart Intelligent Computing and Applications, Smart Innovation, Systems and Technologies, vol 105, Springer, Singapore**, (pp. 33-41).
4. **Sadhukhan, S.***, & Sen Sharma, S. (2014). "A solution of degree-constrained spanning tree using hybrid GA with directed mutation." **Advanced Computing, Networking and Informatics- Volume 1. Smart Innovation, Systems and Technologies, vol 27, Springer, Cham.**, (pp. 653-660).

- ## Book Chapters

1. **Sadhukhan, S.***, & Dey, S. (2021). "Biology, Chemistry, and Physics of Cancer Cell Invasion and Metastasis." **Cancer Diagnostics and Therapeutics: Current Trends, Challenges, and Future Perspectives, Springer, Singapore**. (pp 81–109).

2. **Sadhukhan, S.***(2022). "Radiomics: Cropping More from Images." **Cancer Diagnostics and Therapeutics: Current Trends, Challenges, and Future Perspectives, Springer, Singapore**. (pp 461–470).
3. **Sadhukhan, S.***, Banerjee, S., Das, P., & Sangaiah, A. K. (2018). "Producing better disaster management plan in post-disaster situation using social media mining." **In Computational Intelligence for multimedia big data on the cloud with engineering applications. Academic Press**. (pp. 171-183).

# Personal Details

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| **Date of birth:** | 17/07/1986 |
| **Permanent address:** | 2516, Pioneer Park, Shantineer Apartment<br>Barasat, North 24 PGS<br>West Bengal 700124, India. |
| **Nationality:** | Indian |
| **Marital status:** | Married |
| **Linguistic ability:** | Bengali (Mother tongue), Hindi (Fluent), English (Good) |