

# Alakananda Mitra, Ph.D.

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Adaptive Cropping Systems Laboratory (ACSL)

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## CURRENT EMPLOYMENT

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March 2023 - Present **Research Assistant Professor**  
University of Nebraska-Lincoln, Nebraska, USA

March 2023 - Present **Visiting Computer Scientist**  
USDA-ARS, Beltsville, Maryland, USA

Job Duty

- Leading software development at the joint multi-national effort of UNL and Adaptive Cropping Systems Laboratory (ACSL), USDA-ARS to further develop the crop and soil simulation models, graphical user interfaces, databases, and other suitable agro-climatology modeling tools.
- Building AI-based Crop Yield Model.

## PREVIOUS EMPLOYMENT

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May 2022 – June 2022	Research Assistant	SESL, Department of Computer Science and Engineering, University of North Texas.
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Jan 2020 – Dec 2021	Teaching Assistant	Department of Computer Science and Engineering, University of North Texas.
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## RESEARCH INTERESTS

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- Solving real-world problems with AI and ML techniques and making AI solutions widely available, affordable, and more accessible to people.
- Application of machine learning and deep learning technologies to smart agriculture and AI-based Internet of Agricultural Things (IoAT) frameworks for addressing agricultural research issues and aspects.
- Image forensics, related to social media, Detection and Prevention of Deepfake images, videos, and audios.

## EDUCATION

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University of North Texas, TX, USA.	Computer Science and Engineering GPA: 4.0/4.0 Dissertation: Machine Learning Methods for Data Quality Aspects in Edge Computing Platforms. Major Professor: Prof. Saraju P. Mohanty	Ph.D.	2022
University of Calcutta, India.	Radiophysics & Electronics GPA: 3.93/4.0 Thesis: Modeling of PIN Photodetector using Fuzzy Logic. Major Professor: Prof. N. R. Das	M.Tech.	2006
University of Calcutta, India.	Radiophysics & Electronics GPA: 3.77/4.0 Project: Modeling of IC Inductor using Fuzzy Logic.	B.Tech.	2004
Presidency College, University of Calcutta, India.	Major Professor: Prof. N. R. Das Physics GPA: 3.67/4.0	B.Sc. (Honors)	2001

## AWARD AND HONORS

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1. [Outstanding Early-Stage Doctoral Student 2022](#), Department of Computer Science and Engineering, University of North Texas.

2. IEEE ICC 2022 Student Grant Award, 2022.
3. IEEE INFOCOM 2022 Student Conference Grant Award, 2022.
4. [Best Paper](#) Award 19th OITS International Conference on Information Technology (OCIT), 2021.
5. IEEE-iSES-2021 Student fellowship Travel Grant for IEEE International Symposium on Smart Electronic Systems (iSES), 2021.
6. [University of North Texas Student Travel Grant for GRACE HOPPER Celebration](#) 2021.
7. NSF Student Travel Grant for IEEE Computer Society International Symposium on VLSI (IEEE ISVLSI) 2021.
8. Computer Science and Engineering Departmental Award, University of North Texas, TX, USA, SPRING 2021.
9. Tuition Benefit Scholarship, Toulouse Graduate School, University of North Texas, SPRING 2021.
10. Computer Science and Engineering Departmental Award, University of North Texas, TX, USA, FALL 2020.
11. Tuition Benefit Scholarship, Toulouse Graduate School, University of North Texas, FALL 2020.
12. Computer Science and Engineering Departmental Award, University of North Texas, TX, USA, SPRING 2020.
13. Tuition Benefit Scholarship, Toulouse Graduate School, University of North Texas, SPRING 2020.
14. Skills Achievement Award in Cisco Networking Assistant, North Lake College, Dallas County, Texas, FALL 2016.
15. Skills Achievement Award in Cisco Networking INTERN, North Lake College, Dallas County, Texas, FALL 2016.
16. [Graduate Aptitude Test in Engineering](#) Scholarship (GATE), All India Council for Technical Education (AICTE), 2004.
17. National Scholarship in Bachelor of Science, University of Calcutta, India, 2001.
18. [Merit Certificate under National Scholarships Scheme](#), Education Department of Government of West Bengal, India, 1996.

## PROFESSIONAL EXPERIENCE

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### PANELIST

1. IoT or Food Security and Healthcare, [6th IFIP International Internet of Things](#) 2023.
2. Women in Engineering, [6th IFIP International Internet of Things](#) 2023.

**PUBLICATION CHAIR**      [21st OITS International Conference on Information Technology 2023.](#)

- REVIEWER**
1. Elsevier 2023, 2022.
  2. MDPI 2023.
  3. SN Computer Science 2023, 2022, 2021, 2020.
  4. Journal of Computer and Communications 2023.
  5. Geocarto International, Taylor & Francis 2022.
  6. ACM Journal on Emerging Technology in Computing Systems 2022.
  7. IEEE Consumer Electronics Magazine 2021.
  8. Social Media and Society 2021.
  9. Applied Artificial Intelligence 2022.
  10. 6th International Conference on Computer Science and Application Engineering (CSAE), Nanjing, China 2022.

**INSTRUCTOR**      NSF Funded Interdisciplinary Project “Easy-Med” 2022-2023.

## INVITED LECTURES & PRESENTATION

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### INVITED LECTURES

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1. Smart Agriculture, NSF funded multi-disciplinary project “Easy-Med”, University of North Texas, May 2023.
  2. Artificial Intelligence, NSF funded multi-disciplinary project “Easy-Med”, University of North Texas, May 2023.
  3. Artificial Intelligence, NSF funded multi-disciplinary project “Easy-Med”, University of North Texas, May 2022.
  4. Data Quality Assurance in IoT Enabled Systems, University of North Texas, March 2022.
  5. Artificial Intelligence and Machine Learning, University of North Texas, February 2022.
  6. Artificial Intelligence Machine Learning- Basics and Applications, Invited Lecture, at Summer Training of NSF Funded Interdisciplinary Project “Easy-Med”, University of North Texas, May 2021.
  7. Integrated Circuit Synthesis and EDA Tools Tutorial, University of North Texas, November 2021.
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### PRESENTATIONS

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8. A Novel Machine Learning Approach for Cotton Yield Prediction, AGU Fall Meeting, December 2023.
9. Smart Agriculture – Demystified, in 6th IFIP International Internet of Things (IoT) Conference (IFIP-IoT), November 2023.
10. iLog 2.0: A Novel Method for Food Nutritional Value Automatic Quantification in Smart Healthcare, IEEE International Symposium on Smart Electronic Systems, December 2022.
11. EasyDeep: An IoT-friendly robust detection method for GAN generated deepfake images in social media, 4th IFIP International Internet of Things (IoT) Conference (IFIP-IoT), November 2021.
12. Detection of deep-morphed deepfake images to make robust automatic facial recognition systems, 19th OITS International Conference on Information Technology (OCIT), December 2021.
13. iFace: A Deepfake Resilient Digital Identification Framework for Smart Cities, IEEE International Symposium on Smart Electronic Systems (iSES), December 2021.
14. A Novel Machine Learning based Method for Deepfake Video Detection in Social Media, IEEE International Symposium on Smart Electronic Systems (iSES), December 2020.
15. A simplified approach to model an IC Inductor on Si substrate, General Assembly of International Union of Radio Science (URSI) India, October 2005.
16. Modeling of pin Photodetector using Fuzzy Logic, 3rd International Conference on Computers and Devices for Communication (CODEC-06) India, December 2006.

## MENTORING

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1. I. D. Siripurapu, Ph.D., Computer Science & Engineering, University of North Texas, Fall 2023- Present.
2. C. Dockendorf, M.S., Computer Science & Engineering, University of North Texas, Fall 2022 – Present.
3. A. Alkinani, M.S., Computer Science & Engineering, University of North Texas, Fall 2022 – Fall 2023.
4. K. K. Kethineni, Ph.D., Computer Science & Engineering, University of North Texas, Fall 2022 – Spring 2023.
5. J. Toney, B. S., Computer Science & Engineering, University of North Texas, Spring 2022.
6. S. Goel, Texas Academy of Math and Science (TAMS), University of North Texas, Fall 2022 – Spring 2023.
7. R. Rajan, Texas Academy of Math and Science (TAMS), University of North Texas, Fall 2022.
8. M. Huang, Texas Academy of Math and Science (TAMS), University of North Texas, Spring 2022 – Summer 2022.

9. Singhal, Texas Academy of Math and Science (TAMS), University of North Texas, Fall 2021 –Spring 2022.
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## PATENTS & PUBLICATIONS

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### PATENTS

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1. S. P. Mohanty, E. Kougianos, and **A. Mitra**, [Method for Synthetic Video/Image Detection](#), USA Utility Patent, October 2023. (Waiting for the details from the university).
  2. S. P. Mohanty, E. Kougianos, and **A. Mitra**, [MyAgroPal: Systems of Systems to Assist Farmers](#), USA Provisional Patent Application Number: 63/510,881, Filed on: 28 June 2023.
  3. S. P. Mohanty, E. Kougianos, and **A. Mitra**, [Method for Synthetic Video/Image Detection](#), USA Provisional Patent Application Number: 63/379,248, Filed on: 12 Oct 2022.
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### ARTICLES

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1. **A. Mitra**, S. P. Mohanty, and E. Kougianos, “[aGROdet 2.0: An Automated Real Time Approach for Multiclass Plant Disease Detection](#)”, *Springer Nature Computer Science (SN-CS)*, Vol. 4, No. 5, Sep 2023, Article: 657, 20-pages, DOI: <https://doi.org/10.1007/s42979-023-02076-6>.
  2. **A. Mitra**, D. Bigioi, S. P. Mohanty, P. Corcoran, and E. Kougianos, “[iFace 1.1: A Proof-of-Concept of a Facial Authentication Based Digital ID for Smart Cities](#)”, *IEEE Access Journal*, Vol. 10, 2022, pp. 71791–71804, DOI: <https://doi.org/10.1109/ACCESS.2022.3187686>.
  3. **A. Mitra**, A. Singhal, S. P. Mohanty, E. Kougianos, and C. Ray, “[eCrop: A Novel Framework for Automatic Crop Damage Estimation in Smart Agriculture](#)”, *Springer Nature Computer Science (SN-CS)*, Vol. 3, No. 319, 2022, Article: NN, 16-pages, DOI: <https://doi.org/10.1007/s42979-022-01216-8>.
  4. **A. Mitra**, S. L. T. Vangipuram, A. K. Bapatla, V. K. V. V. Bathalapalli, S. P. Mohanty, E. Kougianos, and C. Ray, “Everything You wanted to Know about Smart Agriculture”, *arXiv Computer Science*, [arXiv:2201.04754](https://arxiv.org/abs/2201.04754), Jan 2022, 45-pages.
  5. **A. Mitra**, S. P. Mohanty, P. Corcoran, and E. Kougianos, “[A Machine Learning based Approach for Social Media Deepfake Video Detection through Key Video Frame Extraction](#)”, *Springer Nature Computer Science Journal*, 2021, Vol. 2, No. 2, Article: 99, 18-pages, DOI: <https://doi.org/10.1007/s42979-021-00495-x>.
  6. N. R. Das, **A. Mitra**, “A New Approach to the Modelling of Si-RFIC Inductor”, *Microwave and Optical Technology Letters*, Vol.48. No.6, June 2006, pp.1095-1101, DOI: <https://doi.org/10.1002/mop.21610>.
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7. **A. Mitra**, S. Beegum, D. Fleisher, V. R. Reddy, W. Sun, C. Ray, D. Timlin, and A. Malakar, “A Novel Machine Learning Approach for Cotton Yield Prediction”, AGU Fall Meeting, 2023, Accepted.
8. **A. Mitra**, S. P. Mohanty, and E. Kougianos, “[Smart Agriculture – Demystified](#)”, in *Internet of Things. Advances in Information and Communication Technology. IFIP-IoT*, 2023, vol. 684, pp. 405-411, DOI: [10.1007/978-3-031-45878-1\\_28](https://doi.org/10.1007/978-3-031-45878-1_28).
9. K. Kethineni, **A. Mitra**, S. P. Mohanty, and E. Kougianos, “[WeedOut: An Autonomous Weed Sprayer in Smart Agriculture Framework using Semi-Supervised Non-CNN Annotation](#)”, *Internet of Things. Advances in Information and Communication Technology. IFIP-IoT 2023*, vol 684, pp. 415-423. DOI: [10.1007/978-3-031-45878-1\\_29](https://doi.org/10.1007/978-3-031-45878-1_29).
10. C. Dockendorf, **A. Mitra**, S. P. Mohanty, and E. Kougianos, “[Lite-Agro: Exploring Light-Duty Computing Platforms for IoAT-Edge AI in Plant Disease Identification](#)”, in *Internet of Things. Advances in Information and Communication Technology. IFIP-IoT 2023*, vol 684, pp. 371-380. DOI: [10.1007/978-3-031-45882-8\\_25](https://doi.org/10.1007/978-3-031-45882-8_25). **(Best Paper @ Research Demo Session)**
11. **A. Mitra**, S. Goel, S. P. Mohanty, E. Kougianos, and L. Rachakonda, “[iLog 2.0: A Novel Method for Food Nutritional Value Automatic Quantification in Smart Healthcare](#)”, in *Proceedings of the IEEE International Symposium on Smart Electronic Systems (iSES)*, 2022, pp. 683–688, DOI: [10.1109/iSES54909.2022.00152](https://doi.org/10.1109/iSES54909.2022.00152).
12. @ RDSA. **Mitra**, S. P. Mohanty, and E. Kougianos, “[aGROdet: A Novel Framework for Plant Disease Detection and Leaf Damage Estimation](#)”, in Proceedings of the IFIP International Internet of Things Conference (IFIP-IoT), 2022, pp. 3–22, DOI: [https://doi.org/10.1007/978-3-031-18872-5\\_1](https://doi.org/10.1007/978-3-031-18872-5_1).
13. **A. Mitra**, S. P. Mohanty, and E. Kougianos, “[A Smart Agriculture Framework to Automatically Track the Spread of Plant Diseases using Mask Region-based Convolutional Neural Network](#)”, in Proceedings of the IFIP International Internet of Things Conference (IFIP-IoT), 2022, pp. 68–85, DOI: [https://doi.org/10.1007/978-3-031-18872-5\\_5](https://doi.org/10.1007/978-3-031-18872-5_5).
14. **Alakananda Mitra**, Saraju P. Mohanty, Peter Corcoran, and Elias Kougianos, “[Detection of Deep-morphed Deepfake Images to Make Robust Automatic Facial Recognition Systems](#)”, In Proceedings of the 19th OITS International Conference on Information Technology (OCIT), 2021, DOI: <https://doi.org/10.1109/OCIT53463.2021.00039>. **(Best Paper)**
15. **Alakananda Mitra**, Saraju P. Mohanty, Peter Corcoran, and Elias Kougianos, “[iFace: A Deepfake Resilient Digital Identification Framework for Smart Cities](#)”, In Proceedings of IEEE International Symposium on Smart Electronic Systems (iSES), 2021, DOI: <https://doi.org/10.1109/iSES52644.2021.00090>. **(Nominated for Best Paper)**
16. **Alakananda Mitra**, Saraju P. Mohanty, Peter Corcoran, and Elias Kougianos, “[EasyDeep: An IoT Friendly Robust Detection Method for GAN Generated Deepfake Images in Social Media](#)”, In Proceedings of the 4th IFIP International Internet of

- Things (IoT) Conference (IFIP-IoT), 2021, DOI: [https://doi.org/10.1007/978-3-030-96466-5\\_14](https://doi.org/10.1007/978-3-030-96466-5_14).
17. **A. Mitra**, S.P. Mohanty, P. Corcoran, E. Kougianos: “[A Novel Machine Learning based Method for Deepfake Video Detection in Social Media](#)”, In Proceeding of IEEE International Symposium on Smart Electronic Systems (iSES), 2020, pp. 91-96, DOI: <https://doi.org/10.1109/iSES50453.2020.00031>.
  18. N. R. Das & **Alakananda Mitra** “[Modeling of pin Photo-detector using Fuzzy Logic](#)”, In Proceedings of the 3rd International Conference on Computers and Devices for Communication (CODEC-06), India, 2006, pp. 461-464.
  19. N. R. Das, **Alakananda Mitra**, and Amit Maji, “[A Simplified Approach to Model an IC Inductor on Si Substrate](#)”, In Proceeding of General Assembly of International Union of Radio Science (URSI), India, 2005.

## CERTIFICATIONS

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Graduate Student Teaching Excellence Program (GSTEP)	MAY 2022
Cisco Certified Network Associate (CCNA)	MAY 2017

## PROFESSIONAL SOCIETY MEMBERSHIPS

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Institute of Electrical and Electronics Engineers (IEEE)  
American Geophysical Union (AGU)  
AnitaB Organization

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