


RESEARCH ASSOCIATE

CYENS - CENTRE OF EXCELLENCE (SuPERWORLD MRG)

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NICOSIA, CYPRUS

Email: indrakalita09@gmail.comindrajit.kalita@iiitg.ac.in**RESEARCH INTERESTS**

- Deep Learning, Computer Vision, Remotely Sensed Image Analysis, Agriculture monitoring
- Worked on a variety of computer vision challenges, including classification, image segmentation, and change detection using Deep Convolutional Neural Networks (DCNN), pre-trained DCNN (such as AlexNet, GoogleNet, VGG16), Attention Networks, Long Short Term Memory Networks, U-NET, Siamese Networks, adversarial networks, and Autoencoders.
- Experience with developing adaptive classification models using images from two different domains (domain adaptation).

EDUCATION

Degree	University	CPI/%	Year
Ph.D. in Com. Sc. & Engg.	IIT Guwahati, Guwahati	–	2017–2022
Master of Technology in Information Technology	Tezpur University, Tezpur	9.06/10	2015–2017
Bachelor of Engineering in Com. Sc. & Engg.	Gauhati University, Guwahati	71.72%	2009–2013

RESEARCH EXPERIENCE

1. POSITION: RESEARCH ASSOCIATE *(8th June 2022 - ongoing)*
ORGANIZATION: CYENS Centre of Excellence (SuPerWorld MRG), Nicosia, Cyprus
2. POSITION: SENIOR RESEARCH FELLOW *(1th August 2019- 23 August 2020)*
P.I.: Dr. Moumita Roy, IIIT Guwahati, India
ORGANIZATION: Indian Institute of Information Technology, Guwahati
3. POSITION: JUNIOR RESEARCH FELLOW *(20th July 2017- 31th July 2019)*
P.I.: Dr. Moumita Roy, IIIT Guwahati, India
ORGANIZATION: Indian Institute of Information Technology, Guwahati
4. POSITION: ASSISTANT PROJECT ENGINEER *(April 2014- July 2015)*
P.I.: Prof. S. R. Mahadeva Prasanna, Dept. of EEE, IIT Guwahati, India
ORGANIZATION: Indian Institute of Technology, Guwahati

MAJOR PROJECTS UNDERTAKEN

- PH.D. WORK: “Deep learning based adaptive land cover monitoring by analyzing remotely sensed images”
SUPERVISOR: Dr. Moumita Roy, IIIT Guwahati *(July 2017- September 2022)*
 - Development of deep neural networks based scene-level LCC technique under homogeneous DA scenario.

- Designing of fusion-based scene-level LCC technique under heterogeneous DA scenario.
- Development of deep learning based scene-level LCC techniques using multi-temporal VHR images under DA scenario.
- Designing of LCC technique using multi-sensor remotely sensed images under DA scenario.
- Designing of deep learning models for (adaptive/non-adaptive) agriculture monitoring using UAV-based VHR images (as an application of scene-level LCC)
- PH.D. INTERNSHIP: “Land Use Land Cover Monitoring around Cyprus by analyzing remotely sensed images”
SUPERVISOR: Dr. Andreas Kamilaris, Team Leader SuPerWorld, CYENS Center of Excellence, Cyprus
(December, 2020-May,2022)
 - Development of scene segmentation model for Land Use/Land Cover monitoring.
 - Designing a land-use change detection model for monitoring the frequent changes in Cyprus using remotely sensed images.
- M.TECH. DISSERTATION: “Image Classification using Deep Convolutional Neural Network”
SUPERVISOR: Prof. Bhogeswar Borah, Tezpur University
 - Developed an automatic image classifier using a Deep Convolutional Neural Network.
 - Developed an automatic image classifier on datasets with limited samples using transfer learning techniques.
- B.E. DISSERTATION: “LAN/INTERNET based Device controlling and data Acquisition system”
SUPERVISOR: Mr. Manojit Ghose, GIMT, Guwahati
 - Controlling the electrical/electronic device through LAN and capturing environmental data and storing it in memory for further processing.

PUBLICATIONS

- **Book Chapter**

- B1. Shounak Chakraborty, Nikumani Choudhury, and **Indrajit Kalita**, “AI-based Smart Agriculture Monitoring using Ground-based and Remotely Sensed Images”, in *The New Advanced Society: Artificial Intelligence and Industrial Internet of Things Paradigm*, Wiley, Chapter 9, 2018, Pages 191-221.

- **Journals**

- J1. **Indrajit Kalita**, and Moumita Roy, “Class-wise Subspace Alignment-based Unsupervised Adaptive Land Cover Classification in Scene-level Using Deep Siamese Network”, in *Transactions on Neural Networks and Learning Systems, IEEE*, 2018, Pages 1-12, **Impact Factor: 14.25** (Early access).
- J2. **Indrajit Kalita**, Runku Nikhil Sai Kumar, and Moumita Roy, “Deep learning-based cross-sensor domain adaptation under active learning for land cover classification”, in *Geoscience and Remote Sensing Letters, IEEE*, Vol. 19, 2021, Pages 1-5, **Impact Factor: 5.34**.
- J3. **Indrajit Kalita**, and Moumita Roy, “Deep Neural Network based Heterogeneous Domain Adaptation using Ensemble Decision in Land-Cover Classification”, in *Transactions on Artificial Intelligence, IEEE*, Vol. 1(2), 2020, Pages 167-180, **Impact Factor: NA**.
- J4. **Indrajit Kalita**, Gyan Prakash Singh, and Moumita Roy, “Crop classification using aerial images by analyzing an ensemble of DCNNs under multi-filter & multi-scale framework”, in *Multimedia Tools and Applications, Springer*, 2018, Pages 1-25 **Impact Factor: 2.57** (Early access)

J5. **Indrajit Kalita**, Shounak Chakraborty, Tala Giridhara Ganesh Reddy, and Moumita Roy, “A deep learning-based technique for firm annotation and domain adaptation in land cover classification using time-series aerial images”, in *Transactions on Neural Networks and Learning Systems, IEEE*. (Under review)

- **Conferences**

C1. **Indrajit Kalita**, and Moumita Roy, “Inception time DCNN for land cover classification by analyzing multi-temporal remotely sensed images”, in *Geoscience and Remote Sensing Symposium (IGARSS-2022, IEEE)*, 2022, Pages 5736-5739.

C2. **Indrajit Kalita**, Nikhil Mugganawar, and Moumita Roy, “Unsupervised crosssensor domain adaptation using adversarial network for land cover classification”, in *Geoscience and Remote Sensing Symposium (IGARSS-2022, IEEE)*, 2022, Pages 5724-5727.

C3. **Indrajit Kalita**, and Moumita Roy, “Deep learning method for agriculture monitoring under adaptive environment using UAV-based aerial images”, in *IEEE Region 10 Symposium (TENSYP-2022, IEEE)*, 2022, Pages 1-6.

C4. **Indrajit Kalita**, Savvas Karatsiolis, and Andreas Kamilaris, “Land Use Change Detection Using Deep Siamese Neural Networks and Weakly Supervised Learning”, in *International Conference on Computer Analysis of Images and Patterns (CAIP, Springer)*, 2021, Pages 24-25.

C5. **Indrajit Kalita**, Shounak Chakraborty, and Moumita Roy, “Deep Ensemble Network for handling class-imbalance problem in land-cover classification”, in *International Conference on Information Technology (ICIT, IEEE)*, 2019, Pages 505-509.

C6. Shounak Chakraborty, **Indrajit Kalita**, and Moumita Roy, “An adversarial learning mechanism for dealing with the class-imbalance problem in land-cover classification”, in *International Conference Hybrid Intelligent Systems (HIS, Springer)*, 2019, Pages 188-196.

C7. Shounak Chakraborty, **Indrajit Kalita**, and Moumita Roy, “Unsupervised domain adaptation in land-cover classification under neural approach using feature-level ensemble”, in *Geoscience and Remote Sensing Symposium (IGARSS, IEEE)*, 2019, Pages 724-727.

ACADEMIC ACHIEVEMENTS AND AWARDS

- Selected for the Year-Round Internship Program offered by CYENS Centre of Excellence.
- Cleared UGC-NET examinations conducted by the National Testing Agency (NTA), India.
- Received SRF Fellowship from Science Engineering and Research Board.
- Received JRF Fellowship from Science Engineering and Research Board.
- Was among the top 5 of the graduating batch during Master of Technology.
- Was among the top 5% of the graduating batch during Bachelor of Engineering.
- University Fellowship for Master of Technology studies from Tezpur University.
- Participated in the SAMADHAN competition, a giant online challenge conducted by the Ministry of Human Resource Development, Government of India and finished in the top 200 out of over 2500 participants.
- Received a participation certificate and finished in the top ten of the competition on 'Machine Learning based Feature Extraction of Electrical Substations from Satellite Data', conducted by the International Conference on Emerging Techniques in Computational Intelligence (ICETCI) 2021, and the National Remote Sensing Centre (NRSC-ISRO).
- First Runners-up of “AAROHAN 2013” A state-level Project Competition Conducted by Akhil Bharatiya Vidyarthi Parishad (ABVP, India).

- Winner of “National Standard Examination in Physics 2007-2008” Conducted by Indian Association of Physics Teachers
- Felicitated with “Anandaram Boruah Student Award”, 2007 for the performance of 10th standard board examination by State Government of Assam

WORKSHOP PARTICIPATED

- Attended the workshop on “Machine learning and big data analytics: Application to remote sensing” organized by the Department of Computer Applications, Sikkim University in collaboration with IEEE Geoscience and Remote Sensing Society, IEEE Kolkata Section, August-2019.
- Completed the five days advanced training program on the Internet of Things (IoT), conducted by the Centre for Development of Advanced Computing (CDAC), Government of India at Tezpur University, June-2017.
- Attended the workshop on “High Performance Computing” organized by the Centre for Development of Advanced Computing (CDAC) in collaboration with Tezpur University, March-2017.
- Attended the workshop “IoT and Security” organized by the Department of Computer Science and Engineering, Tezpur University, March-2017.

PROFESSIONAL & ADMINISTRATIVE ACTIVITIES

1. Journal Reviewer
 - *Transactions on Artificial Intelligence*, IEEE.
 - *Cybernetics and Systems*, Taylor and Francis.
 - *Remote Sensing*, MDPI
2. IEEE Graduate Student Member.
3. General Secretary of Welfare Board under the Students’ Gymkhana Council of IITG.

TECHNICAL STRENGTHS

Languages	C, C++, Python, Matlab
Framework/Library	Tensorflow, Keras, Pytorch
Scripting & markup Languages	PHP, HTML, CSS
Document preparation	L ^A T _E X, Microsoft Office
Databases	MySQL
OS Environments	Unix, Windows

HOBBIES

- Cooking
- Playing Cricket
- Vegetable Gardening

LINGUISTIC PROFICIENCY

- English, Hindi, and Assamese

REFERENCES

Prof BS Daya Sagar
(Ph.D. Thesis Examiner)

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Indian Statistical Institute-Bangalore Centre
Bangalore, India
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