CHETRAJ PANDEY

Ph.D. Student,
Dept. of Computer Science,
Georgia State University, Atlanta, GA, USA.

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Education

Jan, 2021 – Present
Ph.D. in Computer Science, Georgia State University, Atlanta, GA, USA.
Advised by: *Dr. Berkay Aydin*
Current CGPA: **4.16** / 4.30 .

Nov, 2013 – Aug, 2017
B.E. Computer Engineering, Tribhuvan University, IOE, ERC, Dharan, Nepal.
CGPA: *75.64%, Dept.* 2^{nd}.

Research Interests

Machine Learning Deep Learning Explainable AI Data Mining Data Science and Analytics

Work Experience

Research Experience

Jan, 2021 – Present
Research Assistant, Data Mining Lab, Georgia State University.
Leading a project on developing the deep learning-based model for solar flare prediction and developing novel techniques in computer science to solve the problems in solar physics.

May, 2019 – Dec, 2020
Research Project Coordinator, Research and Innovation Unit, HCOE.
Supervised research-oriented projects of undergraduate students in computer and electronics engineering, Tribhuvan University, Himalaya College of Engineering (HCOE), Lalitpur, Nepal.

Teaching Experience

Apr, 2020 – Dec, 2020
Lecturer, Tribhuvan University, Himalaya College of Engineering, Nepal.
Spring 2020, BCT Juniors, **Artificial Intelligence**.
Spring 2020, BEX Sophomores, **Discrete Mathematics**.

Apr, 2018 – Mar, 2020
Assistant Lecturer, Tribhuvan University, Himalaya College of Engineering.
Fall 2019, B.Sc. CSIT Juniors, **Artificial Intelligence**.
Fall 2019, BCE Freshmen, **Computer Programming**.
Spring 2019, BCT Juniors, **Artificial Intelligence**.
Spring 2019, BEX Sophomores, **Discrete Mathematics**.
Fall 2018, BCE Freshmen, **Computer Programming**.
Spring 2018, BEX Sophomores, **Discrete Mathematics**.
Spring 2018, BCT Sophomores, **Numerical Methods**.

Sept, 2018 – Dec, 2020
Instructor / Co-founder, Line Academy, Kupondole, Lalitpur, Nepal.

Dec, 2017 – Apr, 2018
Part-time Instructor, Tribhuvan University, Kathmandu Engineering College, Lalitpur, Nepal.
Fall 2017, BCT Freshmen, **Computer Programming**.

Publications

Journal Articles

1. **C. Pandey**, A. Ji, R. A. Angryk, M. K. Georgoulis, and B. Aydin, "Towards coupling full-disk and active region-based flare prediction for operational space weather forecasting," *Frontiers in Astronomy and Space Sciences*, vol. 9, Aug. 2022. DOI: 10.3389/fspas.2022.897301.
2. K. Whitman, R. Egeland, I. G. Richardson, ..., **C. Pandey**, and et al., "Review of solar energetic particle models," *Advances in Space Research*, Aug. 2022. DOI: 10.1016/j.asr.2022.08.006.

Conference Proceedings

1. J. Hong, A. Ji, **C. Pandey**, and B. Aydin, "Beyond traditional flare forecasting: A data-driven labeling approach for high-fidelity predictions," in *Big Data Analytics and Knowledge Discovery*, Springer Nature Switzerland, 2023, pp. 380–385. DOI: 10.1007/978-3-031-39831-5_34.
2. **C. Pandey**, R. A. Angryk, and B. Aydin, "Unveiling the potential of deep learning models for solar flare prediction in near-limb regions," in *22nd International Conference on Machine Learning and Applications (ICMLA), 2023.*, 2023. DOI: 10.48550/arxiv.2309.14483.
3. **C. Pandey**, R. A. Angryk, and B. Aydin, "Explaining full-disk deep learning model for solar flare prediction using attribution methods," in *European Conference on Machine Learning and Knowledge Discovery in Databases: ADS Track, ECML PKDD*, Cham: Springer Nature Switzerland, Sep. 2023, pp. 72–89. DOI: 10.1007/978-3-031-43430-3_5.
4. **C. Pandey**, R. A. Angryk, M. K. Georgoulis, and B. Aydin, "Explainable deep learning-based solar flare prediction with post hoc attention for operational forecasting," in *Discovery Science*, Cham: Springer Nature Switzerland, 2023, pp. 567–581. DOI: 10.1007/978-3-031-45275-8_38.
5. **C. Pandey**, A. Ji, R. A. Angryk, and B. Aydin, "Towards interpretable solar flare prediction with attention-based deep neural networks," in *2023 IEEE Sixth International Conference on Artificial Intelligence and Knowledge Engineering (AIKE)*, 2023. DOI: 10.48550/arxiv.2309.04558.
6. **C. Pandey**, A. Ji, T. Nandakumar, R. A. Angryk, and B. Aydin, "Exploring deep learning for full-disk solar flare prediction with empirical insights from guided grad-cam explanations," in *The 10th IEEE International Conference On Data Science and Advanced Analytics (DSAA)*, IEEE, 2023. DOI: 10.48550/arxiv.2308.15712.
7. **C. Pandey**, R. Angryk, and B. Aydin, "Deep neural networks based solar flare prediction using compressed full-disk line-of-sight magnetograms," in *Information Management and Big Data*, Springer International Publishing, 2022, pp. 380–396. DOI: 10.1007/978-3-031-04447-2_26.
8. **C. Pandey**, R. A. Angryk, and B. Aydin, "Solar flare forecasting with deep neural networks using compressed full-disk HMI magnetograms," in *2021 IEEE International Conference on Big Data (Big Data)*, IEEE, Dec. 2021, pp. 1725–1730. DOI: 10.1109/bigdata52589.2021.9671322.

Posters

1. **C. Pandey**, T. Adeyeha, T. Nandakumar, A. Rafal, and B. Aydin, *Insights into deep learning-based full-disk solar flare prediction with post hoc explanation and evaluation*, 2023, EarthCube 2023 - A Geoscience and Cyberinfrastructure Workshop. DOI: 10.13140/RG.2.2.34673.97124.
2. **C. Pandey**, M. K. Georgoulis, B. Aydin, R. A. Angryk, and A. Ji, *Exploring heuristics in full-disk aggregation from individual active region prediction of solar flares*, 2022, p. 3457. DOI: 10.13140/RG.2.2.34673.97124.
3. **C. Pandey**, A. Ji, R. Angryk, and B. Aydin, *Training and Deployment of Predictive Models for Space Weather Forecasting: An Application on Full-disk and Active Region-based Flare Prediction*, Dec. 2021, AGU Fall Meeting Abstracts, SH55A–1825. URL: https://shorturl.at/bpwZ2.

Skills and Graduate Coursework

Technical Skills

Programming	Python, C, C++, and MATLAB.
Databases	MySQL and PostgreSQL.
Web Dev	HTML, CSS, JavaScript.
Libraries and Framework	Numpy, Pandas, Matplotlib, sklearn, Pytorch, Tensorflow, Keras, Django.
Tools and Environment	Git, Github, LaTeX, Docker, Google Cloud Platform (GCP), and HPCE.

Graduate Courseworks

Spring, 2021	Advanced Machine Learning (A+), Database Systems (A), Computer Science Teaching Pedagogy (S), and Seminar in Computer Science (S).
Fall, 2021	Advanced Deep Learning (A), Digital Image Processing (A+), and Fundamentals of Data Science (A+).
Spring, 2022	Advanced Computer Networks (A) and Computer Vision (A).
Fall, 2022	Advanced Topics in Deep Learning (A+) and Advanced Data Mining (A).

Awards and Certifications

Awards and Achievements

Jun 27–28, 2023	**Early-career Travel Award** , EarthCube 2023, Building Upon the EarthCube Community: A Geoscience and Cyberinfrastructure Workshop.
May, 2021– Aug, 2022	Second Century Initiative (2CI), **University Doctoral Fellowship**, Georgia State University.
Jul, 2016 – Jun, 2017	4th Committee **President,** Association of Computer Engineering Students (ACES), Purwanchal Campus, Dharan, Nepal.
Nov, 2013 – Aug, 2017	**Full Governmental Scholarship on Merit**, Bachelors in Computer Engineering at Tribhuvan University, Institute of Engineering, Dharan, Nepal.

Certifications

Jul, 2020	Neural Networks and Deep Learning, Coursera. [certificate].
Oct, 2020	Structuring Machine Learning Projects, Coursera. [certificate].
	Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization. [certificate].
Mar, 2021	Research Administrators Conduct of Research Course 1, CITI Program. [certificate].

References

Dr. Berkay Aydin
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Georgia State University, Atlanta, GA, USA
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Dr. Rafal A. Angryk
Distinguished University Professor,
Dept. of Computer Science,
Georgia State University, Atlanta, GA, USA
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