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 Con Advised by: D	nputer Science , Georgia <i>r. Berkay Aydin</i>	State University, Atl	anta, GA, USA.
Jan, 2021 – Aug, 2024	• M.S Compute (Requirements	er Science , Georgia State s completed; Degree not c	University, Atlanta, onferred yet.)	, GA, USA.
Nov, 2013 – Aug, 2017	• B.E. Comput	er Engineering , Tribhuv	an University, IOE,	ERC, Dharan, Nepal.

Research Interests

Interpretable/Explainable Deep Learning Multimodal Learning Spatiotemporal Modeling

Work Experience

Research Experience

Jan, 2021 – Present	• Research Assistant, Data Mining Lab, Georgia State University. Leading a project on developing deep learning-based models for solar flare pre- diction and developing novel techniques in computer science to solve the prob- lems in solar physics and space weather forecasting applications.
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 Engi- neering (HCOE), Lalitpur, Nepal.
Teaching Experience	
Jan, 2024 – Apr, 2024	 Instructor/Teaching Fellow, Georgia State University, Atlanta, GA, USA. Spring 2024, CSC 4780/6780 & DSCI 4780, undergraduate & graduate students, Fundamentals of Data Science.
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.

Work Experience (continued)

Sept, 2018 – Dec, 2020	• Instructor / Co-founder, Line Academy, Kupondole, Lalitpur, Nepal.
	★ Computer Programming in C and Fortran
Dec, 2017 – Apr, 2018	• Part-time Instructor, Tribhuvan University, KEC, Kalimati, Lalitpur, Nepal.
	\star Fall 2017, BCT Freshmen, Computer Programming.

Publications

Journal Articles

- 1 K. Whitman, R. Egeland, I. G. Richardson,, C. Pandey, and et al., "Review of solar energetic particle models," *Advances in Space Research*, Aug. 2023. *9* DOI: 10.1016/j.asr.2022.08.006.
- 2 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. *P* DOI: 10.3389/fspas.2022.897301.

Conference Proceedings

- 1 **C. Pandey**, R. A. Angryk, and B. Aydin, "Unveiling the potential of deep learning models for solar flare prediction in near-limb regions," in *2023 International Conference on Machine Learning and Applications (ICMLA)*, IEEE, Dec. 2023. *O* DOI: 10.1109/icmla58977.2023.00103.
- 2 J. Hong, C. Pandey, A. Ji, and B. Aydin, "An innovative solar flare metadata collection for space weather analytics," in 2023 International Conference on Machine Learning and Applications (ICMLA), Dec. 2023, pp. 408–413. *O* DOI: 10.1109/ICMLA58977.2023.00063.
- J. Hong, A. Ji, C. Pandey, and B. Aydin, "Enhancing solar flare prediction with innovative data-driven labels," in 2023 IEEE 5th International Conference on Cognitive Machine Intelligence (CogMI), IEEE, Nov. 2023. ODI: 10.1109/cogmi58952.2023.00035.
- 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, Oct. 2023, pp. 567–581. *O* DOI: 10.1007/978-3-031-45275-8_38.
- 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 2023 IEEE 10th International Conference on Data Science and Advanced Analytics (DSAA), IEEE, Oct. 2023. O DOI: 10.1109/dsaa60987.2023.10302639.
- 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. Ø DOI: 10.1007/978-3-031-43430-3_5.
- 7 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)*, IEEE, Sep. 2023. *O* DOI: 10.1109/aike59827.2023.00021.
- 8 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, Aug. 2023, pp. 380–385. *O* DOI: 10.1007/978-3-031-39831-5_34.

10 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. *9* 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, Jul. 2022, p. 3457. *O* DOI: 10.13140/RG.2.2.34673.97124.

Skills and Graduate Coursework

Technical Skills

Programming Language	• Python, C, C++, and MATLAB.
Databases	• Mysql and Postgresql.
Web Development	 НтмL, css, JavaScript, and Django.

Libraries and Framework

- Tools and Environment
- Numpy, Pandas, Matplotlib, Scikit-Learn, Pytorch, Tensorflow, and Keras.
 Git, Github, LaTFX, Docker, Google Cloud Platform (GCP), and HPCE.

Graduate Courseworks

Spring, 2021 Advanced Machine Learning, Database Systems, Computer Science Teaching Pedagogy, and Seminar in Computer Science.

- Fall, 2021
 Advanced Deep Learning, Digital Image Processing, and Fundamentals of Data Science.
- Spring, 2022 A
- Advanced Computer Networks and Computer Vision.
 - Fall, 2022 Advanced Topics in Deep Learning and Advanced Data Mining.

Awards and Certifications

Awards and Achievements

Jun 03–07, 2024	• NSF Travel Grant , 11 th Community Coordinated Modeling Center (CCMC), NASA, Community Workshop 2024.
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	• 4 th 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.

Awards and Certifications (continued)

Certifications

Jul 14, 2020	 Neural Networks and Deep Learning, Coursera. [certificate].
Oct 2, 2020	• Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization. [certificate].
Oct 19, 2020	• Structuring Machine Learning Projects, Coursera. [certificate].
Mar 18, 2021	• Research Administrators Conduct of Research Course 1, CITI Program. [certificate].

Service to Profession

2024	•	External Reviewer , 27th International Conference on Pattern Recognition (ICPR), 2024.
2023	•	Reviewer, International Conference on Machine Learning and Applications (ICMLA), 2023.

• Session Chair, Session 21B, International Conference on Machine Learning and Applications (ICMLA), 2023.

References

Dr. Berkay Aydin Assistant Professor, Dept. of Computer Science, Georgia State University, Atlanta, GA, USA ≥ baydin2@gsu.edu

Dr. Rafal A. Angryk

Distinguished University Professor, Dept. of Computer Science, Georgia State University, Atlanta, GA, USA ✓ rangryk@gsu.edu