Daniel K. Giles

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Publications and Abstracts

***RotNet*: Fast and Scalable Estimation of Stellar Rotation Periods Using Convolutional Neural Networks**
FDL Starspots Team, 2020, *accepted for the Machine Learning and the Physical Sciences Workshop, NeurIPS 2020.*

Where is Waldo (and his friends)? A comparison of anomaly detection algorithms for time-domain astronomy
Martínez-Galarza, J.R., Bianco, F., Crake, D., Tirumala, K., Mahabal, A.A., Graham, M. J., **Giles, D.**, 2020, *submitted to MNRAS.*

Systematic Serendipity: Outlier Scoring for the Kepler Mission
Giles, D., Walkowicz, L. M., 2020, 499, 524.

Presentation: Systematic Serendipity: Automated Anomaly Detection and Prioritization for Large Datasets
Giles, D., Walkowicz L. M., 2020, *American Astronomical Society*, 235, 232.02.

Presentation: Systematic Serendipity: A Signal-Agnostic Search for Technosignatures Using Unsupervised Machine Learning
Giles, D., Walkowicz, L. M., 2019, *Astrobiology Conference*, 308.6.

Systematic Serendipity: A Test of Unsupervised Machine Learning as a Method for Anomaly Detection
Giles, D., Walkowicz, L. M., 2019, *MNRAS,* 484, 834.

Presentation: Systematic Serendipity: A Method to Discover the Anomalous
Giles, D., Walkowicz L. M., 2018, *American Astronomical Society*, 231, 332.03.

Education

Illinois Institute of Technology, Chicago, IL — *December 2020 (thesis defended November 2020)*
PhD in Physics
Thesis Title: Systematic Serendipity: A Method to Discover Anomalous Astrophysics
Thesis Advisor: Lucianne Walkowicz

Westminster College, New Wilmington, PA — May 2012
B.S. in Physics

Professional

Researcher, Frontier Development Laboratory — Summer 2020
Heliophysics Starspots team

Teaching Assistant, Illinois Institute of Technology — Fall 2015-Spring 2019
Classes: Classical Mechanics, Electricity and Magnetism, Electronics, and Computational Methods

Tutor, Illinois Institute of Technology, Varsity Tutors — 2015-2019
Subjects: Classical Mechanics, Electricity and Magnetism, Algebra, and Calculus

Technical Analyst, The Boeing Company — 2012-2013
Group: Product Integrity and Safety, Post-production Modifications

Teaching Assistant, Westminster College — Spring 2012
Class: Classical Mechanics

Invited Talks and Roles

NASA Technosignatures Workshop, Participant — Fall 2018
Universities Space Research Association

Decolonizing Mars, Participant — Summer 2018
Library of Congress

Research Colloquia, Speaker — Spring 2018
Westminster College

Sigma Pi Sigma, Speaker — Spring 2018
Illinois Institute of Technology

Scientific English Instructor and Presenter — Summer 2016, 2017
Tsinghua University, Institute of Modern Physics

Detecting the Unexpected, Participant — Spring 2017
Space Telescope Science Institute

Networking Symposium, Panelist — Fall 2015
Westminster College

Research

Systematic Serendipity, Illinois Institute of Technology and the Adler Planetarium — Fall 2015-*Present*
Developed an anomaly detection framework to identify outlying data in large, photometric databases
Advisor: Lucianne Walkowicz

Space Weathering on Meteors, Adler Planetarium — Spring 2015
Investigated the relationship of space weathering and close planetary encounters on the Karin family of meteors
Supervisor: Mark Hammergren

VERITAS, Adler Planetarium — Fall 2013-Spring 2015
Modelled gamma ray production methods from active galactic nuclei for comparison to VERITAS observations
Supervisor: Jeffery Grube

Sights of a Changing Universe, Westminster College — Fall 2011–Spring 2012
Advisor: Thomas Oberst
Presented at URAC (2012, Westminster College, Presentation) and NCUR (2012, Weber State University, Poster)

Grants and Awards

LSSTC Data Science Fellowship Program Fellow — 2017-2019

Illinois Space Grant Consortium Fellowship — 2016-2019

Illinois Institute of Technology Research Scholarship — 2013-2014

Albright Scholarship — 2009-2012

Young Presbyterian Scholars — 2009-2012

References

Dr. Lucianne Walkowicz - Thesis Research Advisor
Astronomer, The Adler Planetarium
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Email: lwalkowicz@adlerplanetarium.org

Dr. Jeff Terry - Thesis Committee Chair
Professor, Physics, Illinois Institute of Technology
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Dr. Andrés Muñoz-Jaramillo - FDL Research Mentor
Senior Research Scientist, SouthWest Research Institute,
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