RYAN HAUSEN

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RESEARCH INTERESTS

Computer vision and deep learning algorithms for image analysis, especially within the domain of astronomical imaging. Software techniques and tools for large scale image analysis.

EDUCATION

Exp. 2022	University of California, Santa Cruz	Ph.D., Computer Science
		Advisors – Brant Robertson
		– Roberto Manduchi
2019	University of California, Santa Cruz	M.S., Computer Science
2014	Azusa Pacific University	B.A., Computer Information Systems

AWARDS

2015-2020	Cota-Robles Fellowship	University of California, Santa Cruz
2013	Dean's List	Azusa Pacific University
2012	Dean's List	Azusa Pacific University

ANNOTATED PUBLICATIONS

Hausen, R. and Robertson, B. E., "FitsMap: A Simple, Lightweight Tool For Displaying Interactive Astronomical Image and Catalog Data", Submitted to Astronomy and Computing, arXiv:2201.12308, 2022. *Releases a new tool for displaying large astronomical image and catalog data with minimal hardware requirements capable of rendering millions of sources on a mobile device.*

Hausen, R. and Robertson, B. E., "Partial-Attribution Instance Segmentation for Astronomical Source Detection and Deblending", Fourth Workshop on Machine Learning and the Physical Sciences, NeurIPS 2021. *Introduces a new technique for deblending multiple sources in astronomical images and releases a novel deep neural network approach to the technique.*

Drakos, N., Villasenor, B., Robertson, B. E., **Hausen, R.**, … & Wechsler, R. H*., "*Deep Realistic Extragalactic Model (DREaM) Galaxy Catalogs: Predictions for a Roman Ultra-Deep Field", Accepted to the Astrophysical Journal arXiv:2110.10703, 2021. *Releases a synthetic image and catalog to study and prepare for the upcoming JWST and Roman datasets.*

Hausen, R. and Robertson, B. E., "Morpheus: A Deep Learning Framework for the Pixel-level Analysis of Astronomical Image Data", The Astrophysical Journal Supplement Series, vol. 248, no. 1, pp. 1-37, 2020. *Introduces pixel-level morphology as an astronomical source analysis paradigm. Releases a state-of-the-art deep learning model for pixel-level morphological classification. Releases pixel-level morphological catalog for astronomical images consisting of more than 2,000,000,000 pixels.*

Neller, T. W., Keeley, S., Guerzhoy, M., Hoenig, W., Li, J., Koenig, S., **Hausen, R.**, … & Resnick, C., "Model AI Assignments 2020", AAAI 2020. pp. 1-3, 2020. *Releases a version of the game Connect 4 with a graphical interface, where students implement adversarial agents and can play the game against their implemented agents.*

Robertson, B. E., Banjeri, M., Brough, S., Davies, R. L., Ferguson, H. C., **Hausen, R.**, … & Wechsler, R. H., "Galaxy Formation and evolution science in the era of the Large Synoptic Survey Telescope", Nature Reviews Physics, vol. 1, no. 7, pp. 450-462, 2019. *The Vera Rubin Observatory (formerly LSST) will revolutionize observational astronomy by providing the deepest wide-angle view of the Universe to date. Explores research efforts to prepare for the data from Vera Rubin Observatory data.*

Norouzi, N. and **Hausen, R.**, "Quantitative Evaluation of Student Engagement in a Large-Scale Introduction to Programming Course using a Cloud-based Automatic Grading System", 2018 IEEE Frontiers in Education Conference, pp. 1-5, 2018. *Quantitatively evaluated the efficacy of online automated grading systems for student success. Results demonstrate that such systems can improve overall student success and, in particular, female students and non-major students.*

Hausen, R., Tang, B., Sambasivan, S., and Lin, S., "Maximizing Data Preservation Time in Linear Sensor Networks", 2014 IEEE 11th International Conference on Mobile Ad Hoc and Sensor Systems, pp. 513-514, 2014. *Introduces the data preservation problem for sensor nodes without a base station and presents an optimal and efficient algorithm for linear sensor networks.*

EMPLOYMENT

2016-Pres.	Graduate Student Research Assistant Developing novel computer vision techniques to meet the unique complexities in astronomical imaging data.	University of California, Santa Cruz
2021	Instructor, Beginning Programming in Python Taught basic programming up to Object Oriented Programming. Instructor of record	University of California, Santa Cruz
2018	Teaching Assistant, Artificial Intelligence Wrote assignments and lectured on advanced topics in artificial intelligence. Neller et al. 2020 was a product of this assistantship.	University of California, Santa Cruz
2017-2018	Teaching Assistant, Intermed. Programming Graded assignments, led sections, and lectured on programming. Norouzi and Hausen 2018, was a product of this assistantship.	University of California, Santa Cruz
2013-2015	Software Engineer Developed real-time 24-hour software for power companies. Mentored junior engineers and interns.	Power Settlements
2012-2013	Research Assistant Researched data preservation methods in sensor node networks for which there is not a nearby base station.	Azusa Pacific University