DOOSEOK JUNG

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EDUCATION

Ph.D. in Astrophysics, **University of Massachusetts**, Amherst, MA 2025 (*exp.*)
M.S. in Astronomy, **Yonsei University**, Seoul, Korea (South) 2017
B.S. in Astronomy and Physics, **Yonsei University**, Seoul, Korea (South) 2014

TECHNICAL SKILLS

Programming **Python** (PyTorch), R, Juila, SQL
Platforms **Jupyter Notebook**, Pluto Notebook, GitHub, LaTeX
Modeling Computational Mathematics, Statistical Data Analysis, Numerical Algorithms

EXPERIENCE

University of Massachusetts Amherst, Amherst, MA 2018 – present
Research Assistant

- Developed STARCNET, a multiscale Convolutional Neural Network (CNN) pipeline, to classify star cluster morphologies using Machine Learning (ML).
- Refined stochastic sampling techniques to compare star cluster masses and luminosities.
- Conducted Gaussian convolution fitting to analyze stellar & molecular surface densities.
- Applied linear regression and non-linear curve fitting to analyze star-forming activities.
- Implemented Bayesian model and point-spread function to create star cluster catalogs.

Lecturer, Modern Astronomy, Pre-college Summer Program Summer 2019 & Summer 2020

- Delivered foundational concepts of computational mathematics and statistics and their research applications to pre-college students, utilizing Python and Jupyter Notebook.

Teaching Assistant, UMass Summer Research Experience in Astronomy Summer 2022

- Led hands-on training in SAOImageDS9, a specialized tool for astronomical imaging and data visualization, for local middle-school teachers.

Space Telescope Science Institute, Baltimore, MD Summer 2024
Visiting Scholar

- Optimized Markov Chain Monte Carlo (MCMC) algorithms to estimate star cluster properties in collaboration with the MINGLES group.

Yonsei University, Seoul, Korea (South) 2014 – 2017
Research Assistant

- Utilized Gaussian kernel smoothing and χ^2 fitting to analyze iso-density contour maps of stellar surface densities in globular clusters.

SELECTED PUBLICATIONS

Pérez, G., Messa, M., Calzetti, D., Maji, S., **Jung, D. E.** et al. (2021), The Astrophysical Journal, 907, 100, "STARCNET: Machine Learning for Star Cluster Identification"

CERTIFICATES

Statistics and Astroinformatics for Astronomers, Penn State Univ. Summer 2022

- Enhanced expertise in applied statistics and mathematical modeling through projects in Astrostatistics & Astroinformatics, utilizing diverse computational languages and tools related to ML/AI techniques (e.g. Python, R, Juila, SQL, Physics-informed ML)