Jubayer Ibn Hamid

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EDUCATION

Stanford University

B.S in **Mathematical Physics** CA, USA (Sept'19 - Present)

M.S in **Computer Science** CA, USA (Jan'24 - Present)

PUBLICATIONS *(* denotes equal contribution)*

Tripod: Three Complementary Inductive Biases for Disentangled Representation Learning (2024)

Kyle Hsu*, **Jubayer Ibn Hamid***, Kaylee Burns, Chelsea Finn, Jiajun Wu

(Under Review)

What Makes Pre-trained Visual Representations Successful for Robust Manipulation (2023)

Kaylee Burns, Zach Witzel, **Jubayer Ibn Hamid**, Tianhe Yu, Chelsea Finn, Karol Hausman

Paper Website *(Preprint)*

RESEARCH EXPERIENCE

Stanford Artificial Intelligence Laboratory, Researcher (IRIS Lab) CA, USA (Jan, 2023 - Present)

- Key research interests - machine learning, offline reinforcement learning, representation learning, foundation models
- (Prof. Chelsea Finn and Kaylee Burns) Visual representations designed for manipulation and control tasks do not generalise under distribution shifts such as change in lighting and texture. Demonstration of segmentation ability is a strong predictor of out-of-distribution generalisation among vision transformer models.
- (Prof. Chelsea Finn, Prof. Jiajun Wu and Kyle Hsu) Co-led a project where we researched on inductive biases for **disentangled representation learning** in quantised latent spaces. Our model, Tripod, attained state-of-the-art results on disentanglement benchmarks.

Stanford Applied Physics, Researcher (Stanford LIGO Group - ML team) CA, USA (Feb, 2022 - Aug, 2022)

- Worked under Dr. Ricardo Bassiri and Dr. Kiran Prassai on designing reduced thermal noise coatings for LIGO including macroscopic and/or microscopic material characterizations for amorphous thin films.
- Made computer simulations of the atomic structure of Germania using LAAMPS.
- Used machine learning (Gaussian Process Regression) to predict BKS potential parameters of Germania

Kavli Institute for Particle Astrophysics and Cosmology, Researcher CA, USA (June, 2021 - Sept, 2021)

- Worked under Dr. Chao-Lin Kuo where we designed novel cavities to detect axion particles (candidate particles for dark matter).
- Designed parts for a new formulation of conic-shell cavities using SolidWorks and simulations of EM fields.
- Research showed that the conic shell cavity's dimension changes symmetrically which improves axion detection by the square of its frequency.

RELEVANT COURSEWORK

Computer Science:

- Reinforcement Learning, Natural Language Processing, Deep Generative Models, Machine Learning, Deep Learning, Artificial Intelligence, Design and Analysis of Algorithms

Mathematics:

- Abstract Algebra - Group Theory/Ring Theory, Representation Theory/Module Theory, Topological Manifolds/Differential Topology, Real Analysis, Complex Analysis, Differential Geometry, Convex Optimisation.

Physics:

- Quantum Field Theory, Quantum Mechanics, Lagrangian/Hamiltonian Mechanics, Statistical Mechanics, Electrodynamics