

Takumi Matsuzawa

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EDUCATION

The University of Chicago (Chicago, IL)	2016 - Early 2023(expected)
<i>Ph.D. candidate</i> , Physics, Advisor: Dr. William T.M. Irvine, GPA: 3.81/4.0	
The University of Chicago (Chicago, IL)	2016-17
<i>Master of Science</i> , Physics, Advisor: Dr. Sidney R. Nagel	
Kalamazoo College (Kalamazoo, MI)	2013-16
<i>Bachelor of Arts</i> , Physics with honors and Chemistry, <i>summa cum laude</i> , GPA: 4.0/4.0	

EXPERIENCE

The University of Chicago (Chicago, IL) <i>Graduate researcher</i>	2016-Present
<ul style="list-style-type: none">Engineered an innovative data acquisition system involving multiple high-speed cameras and a pulsed laser for volumetric analyses of complex fluid phenomena such as turbulence (Funded by Army Research Office over \$500k)Created a data pipeline to process TB of raw image data into a few GB for statistical analyses, reducing the processing time from several days to a few hoursBuilt and maintained a Python library (>20k lines) to analyze 3D/4D flow single-handedlyDeveloped an optical flow estimator for particle image velocimetry using a CNNMentored several graduate and undergraduate students for experimental and computational projects including machine-learning vortex dynamics and 4D data visualization	
Kalamazoo College (Kalamazoo, MI) <i>Research Assistant</i>	2013-16
<ul style="list-style-type: none">Directed three independent research projects in theoretical physics, computational neuroscience, and mathematical epidemiology, resulting in an academic paper and a book chapter on the model of synapticity regarding Alzheimer's diseaseImplemented Monte Carlo and molecular dynamics simulations in Java to study how a crystal melts	
Fermi National Accelerator Laboratory (Batavia, IL) <i>Lee Teng Fellow</i>	2015
<ul style="list-style-type: none">Performed particle physics simulations in C++ (Geant4) to assess the merits of the proposed proton beamline upgrade for the Mu2e experiment, one of the flagship projects by Department of Energy	
KEK- High Energy Accelerator Research Organization (Japan) <i>Visiting researcher</i>	2014
<ul style="list-style-type: none">Conducted the laser break-down spectroscopy to evaluate composition of alloys	

SKILLS

Programming	Python (including NumPy, SciPy, Pandas, OpenCV, PyTorch, and Scikit-learn), Java, C, C#, SQL, HTML, CSS, Matlab, shell scripting
Software & Tools	Mathematica, Root, LabView, LAMMPS, Blender, Houdini, \LaTeX , Git
Data analysis	Image processing, computer vision, machine learning; principal component analysis, Monte Carlo methods, parallel and distributed computing
Operating Systems	Linux, Mac, Windows
Techniques	Prototyping, 3D printing, machining, CAD, 2D & 3D velocimetry
Languages	English (proficient), Japanese (native) and German (conversational)

SELETED AWARDS

Grainger Foundation Fellowship for Outstanding Research in Experimental Physics	2022
Sidney Nagel Prize for Creativity in Research	2020
John Wesley Hornbeck Prize for Excellence in Physics	2016
Senior Leadership Recognition Award for Excellence in Teaching	2016