

Clayton W. Seitz, PhD

cwseitz@iu.edu
cwseitz.github.io

PERSONAL STATEMENT	I specialize in the development and application of machine learning methods for computer vision, large language models, time series analysis, and generative modeling. I maintain a strong background in functional and object-oriented programming with experience writing production quality software.	
EDUCATION	Doctor of Philosophy, Physics	2024
	Purdue University	
	Master of Science, Physics	2021
	University of Chicago	
EDUCATION	Bachelor of Science, Physics, Magna Cum Laude	2019
	Indiana University	
	Minor: Mathematics	
	Bachelor of Science, Informatics (Math Focus), Magna Cum Laude	2019
	Indiana University	
EXPERIENCE	Graduate Researcher	2022-Present
	Purdue University, Indianapolis, IN	
	<ul style="list-style-type: none">Designed diffusion models/score-based generative models and general computer vision techniques (object detection, segmentation, etc.) in PyTorch for modeling image datasets in super-resolution fluorescence microscopyDeveloped general probabilistic models for high-dimensional imaging datasets and associated Bayesian methods for statistical inference tasksDeveloped novel hardware systems for super-resolution imaging of human cells	
	Graduate Researcher	2020-2022
	University of Chicago, Chicago, IL	
EXPERIENCE	<ul style="list-style-type: none">Investigated fundamental learning mechanisms in recurrent neural networks (RNNs) using dynamical models, mean-field theory, and time-series analysis.Designed and ran Monte Carlo simulations of spiking neural networks	
	Research Assistant	2019-2020
	Purdue University, Indianapolis, IN	
	<ul style="list-style-type: none">Developed a scientific package in Python for high-throughput object detection and trackingManaged the package lifecycle and user training throughout the laboratory	
	Information Systems Intern	2016
	Liberty Mutual Insurance	
EXPERIENCE	<ul style="list-style-type: none">Wrote Python scripts to automate attestation testing of web facing serversAssisted in configuration of web application firewalls (WAFs)	

AWARDS	<i>NIH Graduate Training Fellowship</i> University of Chicago, Chicago, IL	2020
	<i>Travel Award and Lightning Talk Invitation</i> Physical Sciences in Oncology - Minneapolis, MN	2019
	<i>Hudson and Holland Scholarship for Diversity and Inclusion</i> Indiana University, Bloomington, IN	2013-2017
	<i>Founders Scholar</i> Indiana University, Bloomington, IN	2013-2017
	<i>Cigital Scholarship</i> Indiana University, Bloomington, IN	2016-2017
PUBLICATIONS	Clayton Seitz [†] , Donghong Fu [†] , Mengyuan Liu, Hailan Ma, and Jing Liu. <i>BRD4 phosphorylation regulates the structure of chromatin nanodomains</i> . https://doi.org/10.1101/2024.09.03.611057 . 2024	
	Clayton Seitz and Jing Liu. <i>Uncertainty-aware localization microscopy by variational diffusion</i> . In Review. 2024	
	Clayton Seitz and Jing Liu. <i>Quantum enhanced localization microscopy with a single photon avalanche diode array</i> . In Review. 2024	
	Maelle Locatelli [†] , Josh Lawrimore [†] , Hua Lin [†] , Sarvath Sanaullah, Clayton Seitz , Dave Segall, Paul Kefer, Salvador Moreno Naïke, Benton Lietz, Rebecca Anderson, Julia Holmes, Chongli Yuan, George Holzwarth, Bloom Kerry, Jing Liu, Keith D Bonin, Pierre-Alexandre Vidi. <i>DNA damage reduces heterogeneity and coherence of chromatin motions</i> . PNAS 12 July 2022; 119 (29): 1-11	
	Mengdi Zhang, Clayton Seitz , Garrick Chang, Fadil Iqbal, Hua Lin, and Jing Liu. <i>A guide for single-particle chromatin tracking in live cell nuclei</i> . Cell Biology International 15 January 2022; 46 (5): 683-700	
	Wenting Wu, Farooq Syed, Edward Simpson, Chih-Chun Lee, Jing Liu, Garrick Chang, Chuanpeng Dong, Clayton Seitz , Decio L. Eizirik, Raghavendra G. Mirmira, Yunlong Liu, Carmella Evans-Molina; <i>Impact of Proinflammatory Cytokines on Alternative Splicing Patterns in Human Islets</i> . Diabetes 25 October 2021; 71 (1): 116-127	
	Clayton Seitz , Hailan Ma, and Jing Liu. <i>Cytokine-induced transcriptional memory is evident in the kinetics of transcriptional bursts</i> . Biophysical Society Annual Conference 2022	
SOFTWARE SKILLS	Clayton Seitz , Hua Lin, Keith Bonin, Pierre-Alexandre Vidi, and Jing Liu. <i>Quantifying the spatiotemporal dynamics of dUTP labeled chromatin during the DNA damage response</i> . Biophysical Society Annual Conference 2020	
	Programming Languages & Software: Linux, Bash, Python, R, PyTorch, C/C++, SQL, LaTeX, Git, Docker, SLURM, Azure, AWS	