

# NATHAN BLAIR

2606 Fulton St., Berkeley, CA 94704 • 818 404-0613 • nblair@berkeley.edu • nathanblair.me

## EDUCATION

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University of California, Berkeley | Berkeley, CA

*Bachelor of Science in Electrical Engineering and Computer Science*

May 2020

Graduate Coursework: Computer Vision, Trustworthy Deep Learning, Deep Reinforcement Learning,  
Linear System Theory

GPA: 3.821

Undergraduate Coursework: Machine Learning, Artificial Intelligence, Jazz Improv, Algorithms, Comp. Photography,  
Probability and Random Processes, Optimization Methods, Linear Algebra and Differential Equations,  
Data Structures, Signals and Systems, Discrete Math and Probability Theory, Computer Architecture

## EXPERIENCE

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NASA JPL | Computer Vision Intern (Asteroids)

June 2019 – August 2019

- Built machine learning models for classifying near earth objects.
- Compared deep neural networks, linear models, kernel models, and random projection methods.
- Designed robust visualization methods for model explainability.
- Acted as the sole machine learning scientist on my team.

UC Berkeley | Machine Learning and Control Research with Claire Tomlin

January 2018 – June 2019

- Design new data-efficient machine learning methods for controlling complex robotics systems.
- Test our methods on real “turtlebot” machines and compare the results to established ML algorithms
- Compare results in the real world to results in simulation.
- Consider safety guarantees for complex, risky and poorly understood real world environments.

NASA JPL | Computer Vision Intern (Comets)

June 2018 – August 2018

- Trained a faster-rcnn neural network to detect bright comets in infrared data taken by the WISE satellite.
- Built a library for object detection on astronomical data that extends Tensorflow’s object detection API.
- Wrote scripts for neural network training and evaluation, data collection, and image annotation
- Typed over 4000 lines of commented and tested Python code.

Caltech | Research Support Intern

May 2014 – August 2015, May 2015 – August 2016

- Performed daily quality assurance checks on minor planet candidates.
- Discovered previous undetected comets by “stacking” candidate images.
- Published Co-Author of “The NEOWISE-Discovered Comet Population and the CO+CO<sub>2</sub> Production Rates”

## PROJECTS

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Encouraging Categorical Meaning in the Latent Space of a VAE

- Augmented the variational auto-encoder loss function to encourage latent clustering for multi-class datasets

Automatic Plunderphonic Musical Textures

- Recreates any piece of music from similar samples of songs from a large database of specified genre, resulting in glitchy textures

## SKILLS AND INTERESTS

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Languages:	Python, Cycling74/MaxMSP, Java, MATLAB, C, JavaScript, SQL, PHP, RISC-V, Scheme, HTML, CSS
Libraries:	Numpy, Matplotlib, Tensorflow, PyTorch
Academic Interests:	Machine Learning, Generative Music, Computer Music, Generative Art, AI, Ethical and Safe Learning
Music & Music Software:	Piano, Vibraphone/Percussion   REAPER, Ableton Live, MuseScore   Cycling74/MaxMSP