

Elizabeth Ptacek

fenrirvondernebelungs.com

Post Falls, ID | 208-262-1823 | blackbird658.16@gmail.com

Objective

A position in Software Development

Summary of Qualifications

- Excellent problem-solving skills and learning curve.
- Working knowledge of website construction and media tools including Adobe Firefly.
- More than 10+ year working as a programmer (inc. programming single board computers)
- Considerable experience hacking into largescale multi-programmer projects

Education

Sept., 2005 – Dec., 2013

University of Oregon, Eugene, Oregon | Ph. D Candidate | Physics

- Courses completed include: Special Relativity, Analog and Digital Electronics and Quantum Mechanics.

Sept., 2000 – June., 2005

Massachusetts Institute of Technology, Cambridge, Mass | BS Physics & Mathematics

- Course topics include: Differential Equations, Classical Mechanics, Probability and Random Variables, and Statistics for Applications.

Experience (projects)

Feb., 2016 – Aug., 2016: Jan. 22, 2018 – Feb. 15, 2018

Web Site Programming

- Learned the basics of web-site hosting by setting up a Linux-based local server with database access.
- Used a combination of HTML/CSS, JavaScript, PHP and MySQL to create a web site that could query, write and edit the test database.
- Wrote a brief tutorial on how to setup and configure the server/website which is available upon request

Feb., 2019 – Feb., 2020

MINDS-i-LaserTarget

- Code for photocell laser targets designed to activate only at a specific pulsing laser frequency. Code runs on Arduino boards.

2016 - 2022

Unreal Engine Physics Pawn

- Application that simulates with VR a quadcopter flown with in stabilized mode.

Sept., 2021

RSCam

- Code for running an Intel(c) Realsense T265 camera with the Nvidia(c) Jetson Nano

Aug, 2021 – Present

RoachNet (unfinished)

- A C++ based machine vision program intended to recognize simple shapes by their outlines.
- Hexagon based scale, rotation and transition quantized algorithm for analyzing images.
- Focuses on object identification based on outlines rather than filters.
- Intended to train with directed input for greater control over positive triggers.
- Ideally will run in a reduced form with very low processing capacity: Raspberry Pi W

Nov, 2025

HoGryph

- A collection of routines that perform 3D spatial transformations. Intended for use as a cross check for other algorithms.
- HoGryph contains 4 methods for spatial rotation.
 1. Rotation around an axis by an angle using elementary vector manipulation – often referred to as the Rodrigues method.
 2. Rotation around an axis by an angle using Hamilton's method with quaternions.
 3. Rotation using a 3 by 3 matrix generated from the rotated axis vectors.
 4. Rotation using Euler's angles to generate a 3 by 3 matrix.
- HoGryph can transform between any of the four methods; and derive the starting equations for any of the transforms from the resulting rotation matrix.
- One of HoGryph's methods is numerically unstable; however, that method is being left in place because it still functions as an independent cross-check of the quaternion rotation for most rotation axes.

Jan 2026 - Present

GemsFluid2D

- A GPU-based computational simulation of the 2D Navier-Stokes equation based on Chapter 38 of GPU Gems.
- The CUDA-based Simulation solves the incompressible version of the Navier-Stokes equation for 2D grids of up to 256 by 256 cells with a user-determined input agitating force and/or a sliding wall.
- Accompanied by a series of YouTube videos covering the derivation of the Navier Stokes equation.

Experience (employment)

Dec, 2025 – Present

Data Annotator | Outlier | Remote

- Supporting the development of AI models by editing, evaluating, and creating content for these models to train on.

Dec 14, 2022 – Dec 20, 2024

Stow, Pick, Ship Dock | Amazon FC | Spokane, Washington

- Supporting Amazons customer fulfillment services by manipulating items in support of the automated sort and dispersion system.

Jan, 2019 – Nov, 2022

Programmer | Minds-I | Liberty Lake, Washington

- Programmed and designed pulsed laser target system for UAV robotics competition.
- Supported UAV flight controller software including debugging and updating driver software.
- Explored machine vision systems utilizing single board computers such as the Raspberry Pi and the Jetson Nano.
- Worked a FADAL CNC milling machine to cut parts. Including power-on, proper shutdown, realignment for CS, tool change, and jog to clear fault condition.
- Organized, authored and constructed curriculum for FAA Part 107 test prep. This included using Unreal Engine to generate various graphics and short animations.

March, 2018 – Dec., 2018

Assembler | Raycap (Express Employment Professionals) | Post Falls, Idaho

- Worked 8 to 10 hours shifts standing doing rapid assembly and quality control of various Raycap products especially the assemblies housing the solid-state surge protecting disks.

March, 2016 – March 2018

Store Associate | Walmart | Hayden, Idaho

- As a store associate, covered customer needs, and assisted with restocking.

June, 2015 – Sept., 2015

Associate | Express Employment Professionals | Post Falls, Idaho

- Varied occupations including work in agriculture and hospitality.

June, 2015 – Sept., 2015

Store Associate (Garden) | Home Depot | Coeur d'Alene, Idaho

- Maintained live merchandise and covered customer service as needed.

Sept., 2005 – Dec., 2013

GTF (Teaching Assistant and Researcher) | University of Oregon | Eugene, Oregon

- Analyzed data from the ATLAS experiment of the Large Hadron Collider at CERN.
- Supported the experiment-wide software framework by adding C++ and python scripts to extend the functionality of the tau trigger system.

Samples

Senior Thesis (MIT)

- <https://dspace.mit.edu/handle/1721.1/35051>

GitHub URL:

- <https://github.com/FenrirVonDerNebelungs>

Project URLs:

- <https://github.com/MINDS-i/MINDS-i-LaserTarget> | Laser Target
- <https://github.com/FenrirVonDerNebelungs/RSCam> | Setup for camera
- <https://github.com/FenrirVonDerNebelungs/UnrealDrone> | Physics Simulated Drone Pawn
- https://github.com/FenrirVonDerNebelungs/RoachNet_TF | Machine Vision (in progress)
- <https://github.com/FenrirVonDerNebelungs/HoGryph> | 3D transformations
- <https://github.com/FenrirVonDerNebelungs/GemsFluid2D> | 2D Navier-Stokes

Skills

- Strong background in math including multi-dimensional transformations, multi-variable calculus, Fourier transforms, recursive equations and Lagrangian mechanics
- Experience with coding and single board computers: 10+ years C++, familiar with python and assembler.
- Familiarity with MS Visual Studio and GCC(GNU Compiler)
- Basic working knowledge of JavaScript, Html/CSS, MySQL, Secure Shell(SSH), and server configuration.

