

# David A. Murphy

## Software Engineer

Harleysville, Pennsylvania | dmrphh@gmail.com | 215-859-0861

GitHub | LinkedIn | dmurphy.me

### Professional Summary

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**Computer Science graduate** with hands-on experience in **software engineering** and **machine learning**, proficient in **Python, Java, C++**, and **ROS2**. Skilled at designing and deploying **scalable, production-ready applications**, automating infrastructure with **Docker, AWS**, and **CI/CD pipelines**. Experienced in leveraging **TensorFlow** and **PyTorch** to build innovative AI/ML solutions that solve complex, real-world problems. Known for **innovative problem-solving**, **adaptability**, and a **collaborative mindset**, with a passion for delivering **reliable, impactful software**.

### Education

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#### Pennsylvania State University

May 2025

B.S. in Computer Science, GPA: 3.51

- **Honors:** Dean's List; The National Society of Leadership & Success
- **Relevant Coursework:** Machine Learning & AI; Machine Learning Data Science; Data Structures & Algorithms; Database Design; Software Engineering Design; Data Mining

### Technical Skills

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**Machine Learning & Data Science:** Python, NumPy, Pandas, Matplotlib, Scikit-learn, TensorFlow, PyTorch, Hugging Face Transformers, ONNX, YOLOv8, SQL

**Programming Languages & Systems:** C++, Rust, Java, JavaScript, Go, Kotlin, MATLAB, PowerShell, VBA, ROS2, AprilTags, ConnectWise, Kaseya

**DevOps & CI/CD:** AWS, Azure, Docker, GitHub Actions, CI/CD pipelines, Git, Linux, Neovim, FastAPI, Redis, MongoDB, SQL Server Management Studio, Neovim, VS Code, Visual Studio, PyCharm

### Experience

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#### Integration Services Engineer Intern,

May 2022 – Feb 2023

IT Solutions Consulting, Inc. – Fort Washington, PA

- Built and configured **DataVaults (DVs)** to support **secure, high-performance** data storage solutions for diverse client needs.
- Authored clear and actionable **Standard Operating Procedures (SOPs)** for tasks such as **firewall software upgrades, switch configurations**, and **DV assembly**, enhancing consistency and compliance.
- Configured and optimized **network switches (Layer 2/3)** to ensure **efficient data flow and minimal downtime** across client environments.
- Utilized **ConnectWise** and **Kaseya** for **endpoint management, remote monitoring**, and **service ticketing**, streamlining operations and **improving incident response times**.

#### Contracted Software Engineer,

Jan 2022 – Dec 2022

Chestnut Hill College – Philadelphia, PA

- Collaborated on **process automation initiatives** to improve data accuracy and quality assurance, directly contributing to stronger **data integrity** across systems.
- Performed regular **data audits** and executed **data-cleaning scripts** to identify and resolve **duplicates, anomalies, and inconsistencies**, enhancing system reliability.
- Leveraged **scripting tools (Python, VBA, PowerShell)**, along with **Microsoft Excel**, to **extract, transform, and load (ETL)** large datasets with a focus on **efficiency and scalability**.

## Projects

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### TurtleBot Swarm Intelligence (Sponsored by Lockheed Martin)

GitHub

Contributed to a real-time swarm system using TurtleBots and Raspberry Pi for military-style search and rescue operations:

- Integrated LiDAR, Vex Ultrasonic & **YOLOv8 Nano (ONNX)** for real-time detection and obstacle avoidance
- Leveraged **AI agents** to interpret sensor input and autonomously adapt behaviors for dynamic and unstructured environments.
- Applied **Particle Swarm Optimization (PSO)** in **ROS 2 Jazzy** to enable decentralized swarm coordination
- Built a **modular Python control system** with publish-subscribe messaging for inter-robot communication
- Validated performance through **Gazebo simulations** and **unit-tested** ROS agents for robustness

### T5Summarize

GitHub

Fine-tuned and deployed a Text-to-Text Transfer Transformer (T5) model for summarizing news and long-form text:

- Built a **Streamlit** demo allowing users to input text and receive instant AI-generated summaries
- Leveraged **Hugging Face Transformers** & **PyTorch** for efficient model training and inference
- Demonstrated effectiveness across diverse long-form inputs, showcasing real-world NLP capabilities

### DecibelDetect – Urban Noise Mapping App

GitHub

Developed a web platform that visualizes urban noise pollution using user-submitted decibel data:

- Developed a **noise-pollution heatmap** frontend in **React** for user-submitted decibel readings
- Integrated **Google Maps API** to geolocate and visualize urban noise hotspots
- Engineered a **FastAPI** backend for secure data ingestion, validation, and API handling
- Ensured a **mobile-friendly, accessible** UI/UX for broad user engagement