

Marcin Kierebinski, Machine Learning Engineer II

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LINKS

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SUMMARY

Machine Learning Engineer with over 2 years of experience designing and deploying scalable transformer-based ML pipelines for government and commercial GIS applications. Contributed and managed ML projects involving Computer Vision, Reinforcement Learning, Sensor Fusion, and Custom Dataset Creation. Published research on adaptation of reinforcement learning policies that integrate computer vision and sensor fusion techniques to real world systems. Led the development of an inertial motion capture system, designing the full system architecture, integrating multi-modal sensor data, and optimizing real-time processing for accurate motion tracking.

PROFESSIONAL EXPERIENCE

Terrascope.io: Machine Learning Engineer and Product Manager 10/2022 - Present

- **CV/ML Pipeline Architecture:** Designed scalable computer vision machine learning pipeline for remote sensing, implemented modular **microservices infrastructure** using **Docker** and **Kubernetes** together with **CI/CD** to allow for **5x increase in deployment frequency** and **95% recovery time reduction**.
- **ML Model Research:** Researched, developed, and deployed improvements to a transformer-based semantic segmentation model, achieving a **4.6% higher mIoU** and a **360% processing speed improvement** over the previous architecture. **Supervised data labeling** efforts for a training dataset of over 3,000 geospatial frames.
- **Project Management:** Managed a government contract, ensuring compliance, proper documentation, and timely delivery. Our project of enabling faster and more accurate GIS data analysis at scale was completed successfully based on overall **process efficiency boosted by over 1000%** as reported by users and an **extended contract** for additional development.

NOTABLE PROJECTS/ RESEARCH

Wang Lab, UCSD: Graduate Researcher, Reinforcement Learning 06/2021 - 09/2021

- **Research Development:** Co-developed Multi-Modal Delay Randomization (MMDR), a novel technique addressing simulation-to-reality gaps in reinforcement learning for quadrupedal robots.
- **Performance Optimization:** Achieved a **100% increase in moving distance** and **reduced collision steps by 475%** in simulation, with a **2x improvement in forward efficiency** and near-zero collisions during real-world deployment.
- **Publication:** Published findings in **IROS 2022**, showcasing advancements in reinforcement learning, sensor fusion, and computer vision for robotics.

COBEY Motion: Co-founder, R&D Lead 07/2018 - 06/2022

- **Sensor Fusion and ML Calibration:** Developed and implemented sensor fusion algorithms and a neural network-based calibration system for IMUs, **reducing mean squared error by almost 50%** compared to traditional linear models.
- **Data Pipeline Architecture:** Designed the end-to-end real-time IoT data pipeline using first principles thinking, transmitting motion data from sensors to smartphones and the cloud at desired 1 kHz rate. Optimized for real-time tracking and extended use case flexibility across various configurations, **reducing deployment time by 85%** compared to leading alternatives.
- **Prototype Testing:** Led prototype bring-up, debugging, and testing across 4 hardware iterations, **reducing defect rates by 80%** ensuring product readiness and functionality.
- **ML Model Research:** Pioneered the implementation of motion pattern recognition by researching and benchmarking 3 ML model architectures for time-series data, enabling **recognition of 12 unique motion patterns with 80% accuracy**.

EDUCATION

University of California, San Diego: MS, Intelligent Systems, Robotics, and Controls (ISRC)

09/2020 - 06/2022

- **Team Lead and Ambassador:** The Basement (Blackstone/TechStars)
- **Host:** Organized robotics workshops for Ukrainian orphans in Ossa, Poland
- **Relevant Coursework:**
 - MAE 200 - Controls
 - MAE 281 - Parameter Estimation
 - ECE 271 AB - Neural Networks
 - ECE 276 ABC - Sensing, Estimation, Planning and RL in Robotics

University of California, San Diego: BS, Mechanical Engineering

09/2016 - 06/2020

- **Qualcomm Prize Winner (Hard Hack 2020):** Smart House solution
- **Runner-Up (Hard Hack 2019):** Smart Parking System solution
- **Co-founder:** Polish Society at UCSD
- **Vice President of Design and Development:** University Student Advisory Council
- **Relevant Coursework:**
 - MAE 142 - Signals + Systems
 - MAE 144 - Embedded Control and Robotics
 - MAE 156 AB - Advanced Robotics Lab (Capstone)
 - ECE 140 AB - IoT (Capstone)

SKILLS

Machine Learning:

PyTorch, Deep Learning, Reinforcement Learning, Computer Vision, Transformers, ML Ops, RAG, LLMs, Dataset Preparation, Data Analysis, Triton Inference Server,

Software Development:

Python, C++, JavaScript, SQL, Data Pipeline Design, FastAPI, Git, Django, GitHub Actions, Docker, Kubernetes, AWS, Cloud Computing, Supabase, Redis

System Engineering:

Sensor Fusion, Embedded Systems, Inertial Navigation, Real-Time Control Systems, Motion Planning, State Estimation, Sim2Real Transfer, Kalman Filtering, SLAM, Kinematics & Dynamics, Robot Perception, Prototyping & Hardware Testing

Product Development & Management:

Agile Development, Release Management, Compliance Testing, Product Design, Product Management, API Development, Human Centered Design

LANGUAGES

Polish (native), English (bilingual)