ABDELRAHMAN ABDELKADER

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EDUCATION

Hajim School of Engineering & Applied Sciences, University of Rochester **Rochester, NY**
Master of Science in Computer Science (A STEM-Certified Program) | Cumulative GPA: 4.0/4.0 **Dec 2025**
Awards: Dean's List | Merit Scholarship Full Tuition Recipient
Relevant Coursework: LLMs, Operating Systems, Data Science at Scale, Parallel and Distributed Systems, NLP

Hajim School of Engineering & Applied Sciences, University of Rochester **Rochester, NY**
Bachelor of Science in Computer Science, Minor in Electrical Engineering | GPA: 3.6 /4.0 **May 2021**
Leadership: President & Publicity, Student Association for the Development of Arab Cultural Awareness
Relevant Coursework: Computer Vision, Data Mining, DB Systems, Advanced Cryptography, Computer Security, Logic Design, Circuits I & II, Embedded Systems, Advanced Data Analysis, Computer Networks, Robotics, Algorithms

PROFESSIONAL EXPERIENCE

University of Rochester *(ROC HCI Lab)* **Rochester, NY**
ML Engineer **Jan 2023 – Aug 2024**
- Developed multimodal models to address sparse Parkinson's disease video data, achieving 93% AUROC enabling non-invasive diagnostics
- Optimized models via hyperparameter tuning with Weights & Biases, boosting performance and reducing training time
- Led development of fusion models for Parkinson's detection using semi-supervised speech embeddings, achieving 88% AUROC
- Authored 3+ research papers in top journals, including npj Nature Digital Medicine, AAAI, and IMWUT
- Led drafting of an FDA De Novo application for a novel Parkinson's screening tool, ensuring regulatory compliance and expediting approval

Software Engineer **Jan 2022 – Jan 2023**
- Designed incremental ETL pipeline for GCP/Cloudflare R2, automating manual video extraction and cutting processing time by 96%
- Conducted two national-wide web-based user studies for Parkinson's disease platform, optimizing accessibility and user engagement
- Designed and executed a custom 10TB Dropbox-to-Box migration using API scheduling, ensuring HIPAA compliance saving $10,000

Cloud AI Solutions **Toronto, Canada(Remote)**
Backend Engineer Intern **Oct 2021 - Dec 2021**
- Collaborated in cross-border team on AI solution, delivering project milestones 2 weeks ahead of schedule
- Built secure REST API integrating Azure and AWS extraction services, enabling backend agnostic operations
- Streamlined RESTful API integrations for Azure/AWS, enabling secure cross-platform AI solutions

University of Rochester *(Computer Science Department)* **Rochester, NY**
Head Teaching Assistant **Jan 2020 - May 2021**
- Led weekly meetings for 12 TAs, coordinating study sessions and grading for 4 computer science courses
- Guided 100+ students in learning complex topics in AI, data mining, and data structures, achieving 4.8/5 student satisfaction rating

PUBLICATIONS

A Novel Fusion Architecture for PD Detection – (Abdelrahman Abdelkader, *Tariq Adnan, Md. Saiful Islam,)*
- Under Review, Nature Parkinson's Disease [Paper]

Using AI to measure Parkinson Severity at Home – ***(****Md. Saiful Islam, Wasifur Rahman,* **Abdelrahman Abdelkader)**
- Nature npj Digital medicine 2023 [Paper] [Demo]

Accessible, At-Home Detection of Parkinson's Disease via Multi-task Video Analysis – ***(****Islam, .. ,* **Abdelrahman Abdelkader)**
- AAAI 2025 [Paper] [Demo]

User-Centered Framework to Empower People with Parkinson's Disease – (*Wasifur Rahman,* **Abdelrahman Abdelkader)**
- The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT 2023) [Paper]

PARK: Parkinson's Analysis with Remote Kinetics Tasks – (*Md Saiful Islam, Sangwu Lee,* **Abelrahman Abdelkader)**
- Affective Computing and Intelligent Interaction (ACII) 2023 Demo Track [Paper]

Auto-Gait: Automatic Ataxia Risk Assessment with Computer Vision on Gait Task Videos – ***(****Rahman, .. ,* **Abdelrahman Abdelkader)**
- The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT 2023) [Paper]

MACHINE LEARNING PROJECTS

ArXiv Vectors | Python, Pinecone | [demo]
- Deployed LLM embedding vector search for 200K+ arXiv papers, enabling advanced semantic search capabilities
- Improved search latency by 300% to under 1 second, enhancing user experience for research paper discovery
- Created efficient indexing for vector embeddings, reducing storage by 40% while maintaining search accuracy

Token-Based Hand Pose Representation | Python, PyTorch, Transformers, MediaPipe|
- Built token-based model for hand movement analysis on 500GB dataset, enabling fine-grained gesture recognition
- Pre-trained encoder for occlusion-robust pose estimation, achieving 75% accuracy on partially visible hand gestures

SKILLS

- **Programming Languages:** Python, C/C++, Rust, R, Java
- **ML/DL:** PyTorch, TensorFlow, Transformers, MediaPipe, OpenFace, Weights & Biases, Hugging Face
- **Data Engineering:** ETL pipelines, GCP Ecosystem, S3 Buckets