

# **AI and Machine Learning Initiatives at USC Aiken**

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**Center for Cyber Initiatives,  
Awareness, and Artificial  
Intelligence (CCIA-AI)**



## About the CCIA-AI

The **Center for Cyber Initiatives, Awareness, and Artificial Intelligence (CCIA-AI)** at USC Aiken was established to enhance the university's NSA-designated **Center of Academic Excellence in Cyber Defense (NSA CAE-CD)**. CCIA-AI serves as a strategic hub integrating cybersecurity education, applied AI research, and regional workforce development.

The center unifies efforts by faculty, a dedicated Cyber Director, and the Department of Computer Science, Engineering, and Mathematics to deliver a cutting-edge cyber curriculum infused with artificial intelligence and machine learning. As student enrollment, research outcomes, and industry partnerships continue to grow, the CCIA-AI codifies USC Aiken's leadership in cyber-education and applied AI research.

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## Mission

The CCIA-AI is committed to:

- Producing a career-ready cyber and AI-empowered workforce.
- Advancing applied research in cybersecurity and machine learning.
- Promoting cyber awareness and AI literacy across South Carolina and beyond.

This is achieved through:

- A curriculum rooted in computer science and cybersecurity.

- Integration of machine learning and AI tools in classroom and capstone experiences.
  - Professional development opportunities such as internships, research, and student-led SOC operations.
  - Community and K–12 outreach to inspire future cyber professionals.
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## **Contributing Faculty and Staff**

### **Cybersecurity and AI Faculty:**

- Dr. Hala Strohmeir-Berry – Cybersecurity & AI
- Dr. Ali AlSabeh – Cybersecurity & AI
- Dr. Ahmed Ahmed – Cybersecurity, Electrical Engineering & AI
- Dr. Md Karim – Cybersecurity & AI
- *Vacancy: Software Engineering/AI Faculty (Expected Fall 2026)*

### **AI and Workforce Development Contributors:**

- Tom Scott – USC Aiken Cyber Workforce Development Specialist
  - Ruth Patrick Science Education Center – K–12 Education Staff
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## **Faculty Contributions and Professional Activities**

### **Dr. Hala Strohmeir-Berry – AI/ML Presentations**

- **April 2025** – IEEE Symposium on Digital Forensics & Security, Boston, MA (Session Chair & Research Presenter – AI/ML)
- **April 2025** – IEEE Southeast Conference, Charlotte, NC (Network Threat Detection using Dynamic Ensemble Learning)
- **April 2025** – South Carolina Academy of Science (Poster presentations for capstones using AI/ML)
- **Dec 2024** – IEEE ICCA (Session Chair and research presentation on Jailbreaking ChatGPT)
- **Oct 2024** – Penn State SAP Cybersecurity Conference (Keynote: AI in Supply Chain)
- **Sep 2024** – Aiken, SC (Keynote: Cybersecurity in the Age of AI)
- **Aug 2024** – SRNL Cyber/AI Workforce Event (Keynote)
- **Aug 2024** – UGA Cybersecurity Innovation Symposium (Panelist)

[Google Scholar Profile](#)

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### **Dr. Ahmed Ahmed – Publications in Cybersecurity and AI**

Ahmed's research applies machine learning to smart grid security and cyber defense:

- *Deep Reinforcement Learning for Smart Grids*
- *Blackbox Evasion Attacks and Countermeasures*
- *Federated Learning and Trojan Detection*
- *False Data Injection and Detection in Smart Grids*

Publications appear in:

- IEEE Access
- IEEE CCNC
- IEEE IoT Journal
- Applied Sciences

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### **Dr. Ali AlSabeh – AI & Networking Publications**

Focus: Machine learning models for cybersecurity, P4 programming, and smart networks.

Notable Works:

- *Security Applications of P4 Switches (2022)*
- *Ransomware Detection Models*
- *Deep Packet Inspection for Smart NICs*
- *Generative AI for DGA Detection and Classification*

[Google Scholar Profile](#)

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### **Grants and Funding**

- **GenCyber 2024** – Dr. Strohmeir-Berry & Dr. Gary Senn – *Funded*
- **Cyber Workforce Pipeline to SRNS** – Scott McKay – \$250,000, *Funded*
- **BSRA Workforce Development** – USCA – \$1.6M, *Funded*

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## **Educational Outcomes and AI Instruction**

### **Courses Offered**

#### **Graduate Level:**

- CSCI A620: *Introduction to AI and ML* – Focus on supervised/unsupervised learning, SVM, decision trees, and regression.

#### **Undergraduate Level (Fall 2025):**

- CSCI A300: *Introduction to Machine Learning* – New AI/ML foundational course.
- CSCI A545, Cyber Capstone, and Forensics courses include AI/ML labs.

#### **Tom Scott's AI-Focused Courses (Summer 2025):**

- CSM 389: *IT Legal & Ethics* – Focus on AI's legal and ethical landscape.
- CSM 356: *Special Topics in Cyber* – First 4 of 12 sessions AI-themed, with guest experts.

#### **Presentations:**

- Vigitrust Global Advisory Board (Dublin, Ireland) – AI Strategy at USC Aiken
- Charleston Digital Corridor Meetup – AI & Cyber Integration
- PC Techware AI Framework Review – Full-day event leadership
- AegisX Charleston – AI Governance Framework Review

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## **Program Development**

### **New Certificate: Professional Certificate in AI and Machine Learning with Generative AI**

**Launch:** Academic Year 2025–2026

This hands-on, industry-aligned certificate prepares professionals for careers in AI/ML with a focus on generative AI (ChatGPT, DALL·E, LLMs).

#### **Key Features:**

- 15-week curriculum
- Real-world case studies and labs
- Capstone project
- Tools: Python, TensorFlow, PyTorch, OpenAI APIs, Hugging Face

#### **Weekly Topics (Sample):**

- Week 1: Foundations of AI/ML
  - Week 4: Classification and Decision Trees
  - Week 8: Deep Learning with TensorFlow
  - Week 12: LLMs & Prompt Engineering
  - Week 14: Ethics & AI Governance
  - Week 15: Capstone Presentation
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## **New Course: Artificial Intelligence and Machine Learning with Generative AI**

**Launch:** Academic Year 2025–2026

### **Course Objectives:**

- Build supervised, unsupervised, and generative AI models
- Analyze societal impacts of AI
- Develop real-world solutions using LLMs and CV/NLP models

### **Tools & Frameworks:**

- Python, NumPy, pandas, scikit-learn, PyTorch, TensorFlow
- OpenAI (ChatGPT, DALL·E), Hugging Face Transformers
- Google Colab, GitHub

**Capstone-Driven Learning:** Each student completes a project demonstrating technical mastery and responsible AI application.

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