Annual Report: Central Connecticut State University Presidential Taskforce on Artificial Intelligence

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Harnessing Artificial Intelligence for Central's Future

Artificial Intelligence (AI) has become a defining technology of our time, reshaping industries, transforming societies, and altering the way we teach, learn, and solve problems. At Central Connecticut State University (Central), we are at a pivotal moment where integrating AI into our academic and operational frameworks will redefine our institution's future.

A Campus Poised for Transformation

In her opening campus address, President Toro declared, "This is the year of artificial intelligence!" This bold proclamation set the tone for Central's commitment to embracing AI as a transformative force across academics, research, and operations. Since its formation, the Presidential Taskforce on Artificial Intelligence has worked tirelessly on a multi-faceted strategy aimed at establishing a budget for AI initiatives, designing and constructing an AI corridor, developing new majors and minors focused on artificial intelligence, and implementing comprehensive AI training for students, faculty, and staff.

Already, the impact of AI can be seen in various corners of campus life. In classrooms, students in computer science and data science programs delve into topics like machine learning, robotics, and predictive analytics. Faculty-led research ventures push the boundaries of innovation, exploring cutting-edge fields such as natural language processing and Internet of Things (IoT) applications. On the operational side, AI tools like chatbots are starting to assist students with routine inquiries, offering a glimpse into the broader potential of this technology to enhance campus services.

Yet, these initiatives are just the beginning. Central is uniquely positioned to take its commitment to AI further, setting a precedent for thoughtful, inclusive, and interdisciplinary adoption. While foundational programs in computer science and data science form the backbone of our AI efforts, the integration of AI into non-STEM fields is where Central can truly differentiate itself. Interdisciplinary programs are being developed to explore the intersections of AI with psychology, healthcare, business, education, and the arts, enabling students and faculty to apply AI solutions to a wide array of real-world challenges.

For example, business students are learning how AI transforms supply chains and decision-making processes, while education majors are exploring AI tools to enhance classroom teaching and personalized learning. In healthcare, students are examining the ethical implications and potential benefits of AI-driven diagnostic tools. The arts are also finding a place in the AI ecosystem, with students investigating how AI can augment creativity in music, visual art, and storytelling. The Central Writing Center has featured six different workshop/training activities integrating AI into the classroom in AY 25.

The challenge before us is not simply whether we should embrace AI but how we can do so in a way that upholds our core values of inclusivity, academic excellence, and community engagement. By fostering interdisciplinary collaboration and breaking down silos between departments, Central is creating a

vibrant ecosystem where AI is not confined to a single field but becomes a transformative force across the entire university.

By addressing this challenge head-on and fully leveraging interdisciplinary opportunities, Central can become a leader in harnessing AI to empower students, foster innovation, and benefit society at large. This holistic approach ensures that AI is used not just as a tool for technological advancement, but as a means to improve lives, solve complex problems, and create a more equitable future.

A Vision for AI at Central

- **In the classroom:** Students across disciplines, from business to the arts, learn how AI can solve real-world problems in their fields. New courses and certifications prepare graduates to lead in an AI-driven workforce.
- **In research labs:** Faculty and students collaborate on groundbreaking projects that harness AI to address societal challenges, from public health to climate resilience.
- **On campus:** AI systems optimize operations, enhance cybersecurity, and provide personalized support for students, helping them navigate their academic journeys.
- **In the library:** Librarians work with students, faculty, and staff to equitably build critical AI literacy in research and learning while supporting the Central community as it navigates a rapidly-evolving information ecosystem.
- **In the community:** Central becomes a hub for AI education and innovation, offering workshops for local educators, partnering with industries, and inspiring the next generation of innovators.

This vision is ambitious but achievable. It will require strategic investments, interdisciplinary collaboration, and a commitment to ethical and responsible AI use.

Opportunities and Challenges

The opportunities before Central are immense. Per the World Economic Forum's 2025 Jobs report, 87% of employers surveyed believe that AI and big data skills will be most increased in importance by 2030. (p. 27 https://reports.weforum.org/docs/WEF_Future_of_Jobs_Report_2025.pdf) By expanding our academic offerings, we can equip students with the skills they need to thrive in AI-driven and Workforce-related careers. Interdisciplinary research initiatives can drive innovation, while AI applications in campus operations can improve efficiency and student outcomes. Engaging with the local community and industry partners can position Central as a regional leader in AI education.

However, we must also navigate challenges. Resource constraints, such as funding for infrastructure and faculty training, may limit our capacity to scale quickly. Ethical concerns around bias, data privacy, and equitable access to AI tools require careful consideration. The rapid pace of AI development means we must remain agile and forward-thinking to stay relevant.

Recommendations for Action

To bring this vision to life, we propose the following key initiatives:

1. **Create a physical location supporting AI and Innovation: (COMPLETE)**
   A dedicated space(s) would coordinate AI activities across the university, serving as a hub for research, curriculum development, and community outreach.

   - Research lab constructed RVAC 010
   - Game Changing lab constructed/refurb RVAC 009
   - Classrooms constructed/refurb RVAC 105 & 106
   - Dedicated Dell/NVIDIA server installed/configured/deployed offering NVIDIA GPU processing.
   - Created AI-driven synthetic human with holographic display
   - Equipment such as robotic dogs and synthetic human installed/configured.
   - AWS Account Creation/deployment: Establishment of an Amazon Web Services (AWS) account to support cloud-based AI development and the creation of scalable AI clusters.
   - Microsoft Co-Pilot Studio/pilot deployment: Creation of accounts with Microsoft to support the development and use of the Microsoft Co-Pilot Studio, enabling collaborative AI project development.
   - Signature "Wow" Elements: Unique architectural and design features that make the space visually striking and functional, including interactive displays, digital signage, and immersive environments.

2. **Expand Academic Programs: (IN PROGRESS – MID STAGE)**
   Develop interdisciplinary courses and micro-credentialing programs to teach students how AI applies to diverse fields. Incorporate ethics and societal impacts into the curriculum to foster responsible AI use.

   - Added an AI Concentration to the BS/BA in Computer Science, approved Spring 2024
   - Developing a MS in AI, approved through curriculum and awaiting BOR approval
   - Develop interdisciplinary programs (program/courses) that combine AI with fields like healthcare, business, and social sciences.
   - Offer hands-on AI labs, internships, and project-based learning opportunities. (Complete / OnGoing)
   - Several courses across the disciplines have integrated AI as an application or tool.
   - Develop an undergraduate certificate (stackable cert) to allow those interested in AI, but not a full BS at this time to take courses that lead recognized Certification.

3. **Foster Research and Collaboration: (IN PROGRESS – EARLY STAGE)**

   - Internally, the university has broadened NextGen faculty grants to include AI (Complete)
   - Additionally, the taskforce recommends the university work with the grants office to secure external funding for AI research and encourage interdisciplinary projects that connect faculty and students across departments. (OnGoing)
   - Autonomous Drone: Procurement of a Lidar/Radar-enabled drone for research in AI-driven autonomous navigation and environmental mapping. (Complete)
   - Developed AI knowledge repository - Blackboard Shell Creation: Development of a Blackboard shell to serve as a university-wide repository of AI-related documents, facilitating faculty and staff collaboration and resource sharing. (Complete / OnGoing)

- Contracting and development of comprehensive training materials for Microsoft Co-Pilot, specifically tailored for Office 365, ensuring that all users are equipped to maximize the tool's AI capabilities. (Complete)
- Build partnerships with local businesses and government agencies via Central's Office of Professional Education. (Complete / OnGoing)
- Partner with industry leaders, government agencies, and other academic institutions to collaborate on AI research and development. (Complete / OnGoing)
- Seek funding opportunities for AI research through grants, industry partnerships, and government initiatives. (Complete / OnGoing)
- Build and maintain a GitHub presence in the AI Corridor to maximize the integration and utilization of existing AI routines. (OnGoing)

4. **Enhance Campus Operations with AI: (IN PROGRESS)**
   Implement AI-driven systems for student assistance, similar to Ivy.ai. Pilot predictive analytics tools to optimize class scheduling and resource allocation.

   - Offer hands-on AI labs, internships, and project-based learning opportunities. (Complete / Ongoing)
   - In concert with ITC developed a statement from Faculty Senate ITC on use of AI note-taking bots for meetings (Complete).
   - Student AI Guide: Creation of a student guide outlining the guardrails for responsible AI use, supported by a library-hosted poster and video campaign to raise awareness.
   - Creation of library-sponsored webinar / presentation on use of citations in AI. (Complete)
   - Informed feedback sent to CSCU CIO on development of CSCU system wide policy on AI. (Complete / OnGoing)
   - October AI Conference: Hosting a university-wide conference on October 4th focused on the latest developments and applications of artificial intelligence. (Complete)
   - In-Lab AI Training: Conducting four in-lab training sessions in October and November, allowing faculty and staff hands-on experience with AI lab components. (Complete)
   - Lunch n' Learn Sessions: Organizing four Lunch n' Learn sessions in October and November, encouraging faculty collaboration on AI integration in the classroom, and welcoming those interested in learning more about AI technologies. (Complete)
   - AI in Business Workshop: Hosting a workshop in Spring 2025 on AI in business and industry, featuring faculty and student-curated examples, followed by an evening lecture to engage the broader community.

5. **Engage the Community: (IN PROGRESS)**
   Offer workshops and seminars for K-12 educators, local businesses, and the broader public. Host hackathons and competitions to promote innovation and showcase Central's leadership in AI.

   - Community workshop offered in November 2024 (Complete)
   - Conducted event in concert with Professional Education Scholars for Life (Complete)
   - Webinar scheduled with AARP on Central AI (Feb 2025)

- Engagement with K-12, December 2024, Feb 2025 2x (ReadyCT – Complete / OnGoing)
- AI training offered to academic researchers and cultural heritage professionals in February at the Connecticut Digital Humanities Conference (being held at Central, 2/21-2/22).
- Through Continuing Education, Central's CTI and Library will offer professional development to Connecticut's town clerks on effective and ethical AI usage in March.
- An AI literacy open educational resource was adapted by CENTRAL's Library for the LSC160 course and posted on the GoOpenCT OER repository for any educator in Connecticut (and beyond) to use.
- Use current Harvard Business Press materials (much cheaper than a traditional textbook) to teach MIS202 (In process)
- Negotiate with the company ToolJet to provide at zero cost, a low code/no code solution to teach AI Retrieval Augmented Generation (RAG) application building in MIS202. (In process)
- Develop a community book club that meets monthly to integrate community members into our AI Corridor. (in Process)

6. **Address Ethical and Resource Challenges: (IN PROGRESS – EVOLVING)**
   Develop an AI ethics policy to guide the university's initiatives. Invest in faculty and staff training to build internal expertise. Secure funding for necessary infrastructure upgrades, such as high-performance computing resources.

    - The University ACUE course program selected and purchased 250 faculty/staff on ethics of AI, creating generative AI resistant practices, adopting AI in the classroom.
    - A core course in the AI minor, the LSC160 "Information Exploration in the AI Era" is grounded in an ethical and human-centered AI perspective. Insight into potential AI risks and harms, while keeping the human in the AI loop. A librarian-created AI research guide and tutorial highlight a student approach to AI usage that is R.E.A.L. "Responsible Ethical Accountable, and Learning-Oriented." Librarians support students' proper citation of AI usage.
    - Another core course (MIS202) in the Application of Minor teaches students how to build RAG applications to enhance business processes.

Conclusion

Artificial Intelligence offers Central an extraordinary opportunity to innovate across its mission areas. By embracing AI thoughtfully and strategically, we can empower our students, faculty, and staff to thrive in a rapidly changing world. At the same time, we can uphold our values of inclusivity and social responsibility, ensuring that our AI initiatives benefit not just our campus but also the broader community.

The recommendations in this report provide a roadmap for Central to lead in the responsible adoption of AI, setting a standard for public higher education institutions. With commitment, collaboration, and strategic investment, we can make this vision a reality.

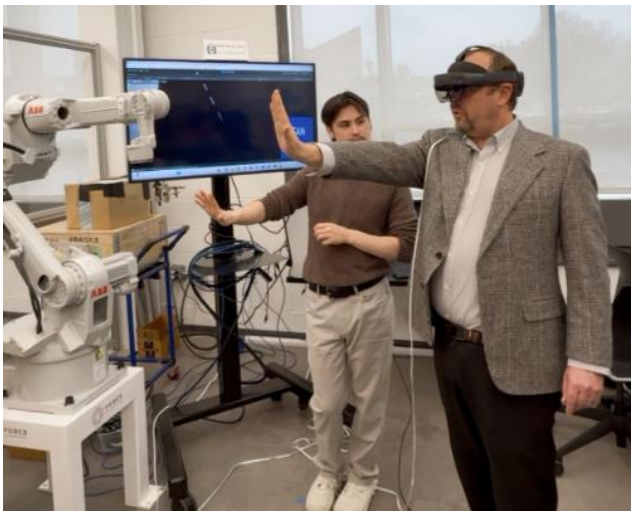
Appendix: 2024-2025 AI Student Exemplars

LLM Automatic Documentation (Team CS MJRS Project)

Creating written documentation automatically using AI/LLM technology, generated from an input video recording. We want to expand this project to use a locally controlled instance of TensorFlow rather than the OpenAI ChatGPT API which we are currently using. We also want to implement user selection of key frames rather than relying on AI to choose the best fitting key frames.

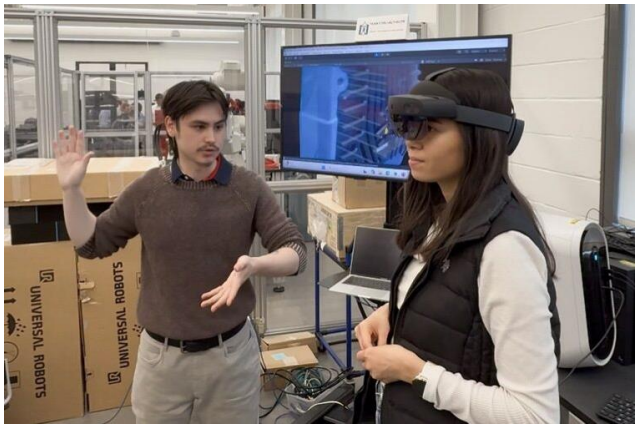
HMI Vision (Team OFKRse Project)

Reading HMI screens using computer vision and alerting personnel when values exceed tolerance/thresholds. We want to expand this project to include the use of webcams in front of older HMI screens which do not have VNC capabilities. We also want to expand the project to include other brands and layouts of HMIs.



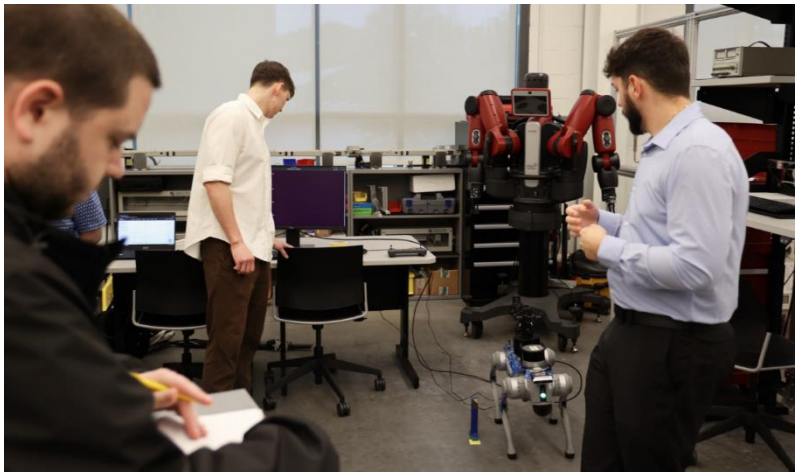
3D Vision Airfoil Scanning

Scanning airfoil parts using the FocalSense sensor in the lab to create a 3D point cloud of the part, accurate to the micrometer level. Strong foundations for this project have been laid by Ryan Mecham, who is willing to be a technical advisor to any team working on this project. Students would work with the FocalSense API and RobotStudio APIs to create a program that instructs the robot to pick up an airfoil and present it to the scanner in various ways that scan the entire part. The scans would be combined to create a full 3D model of the scanned part. This model would then be compared to the CAD model to check for tolerances and defects.



HoloLens AI Satellite Detection

This project was started by Sean Clifford as a NASA grant project over the summer. It uses the HoloLens connected to a Unity project to display information about a satellite. The program is supposed to connect to the camera on the HoloLens to be able to see a model of a satellite in real life, identify the components of the satellite, and display that information to the user. The current version of the program is not working because Sean used Mixed Reality ToolKit (MRTK) versions 2 and 3 together, which are incompatible. We need a team to fix the existing incompatibility issues to get the program to a working state, and then we would like to expand on the AI training. The program uses an AI image classification model called YOLO, and the current training database is too small. We want to expand the existing training data to better identify existing features and then expand further to introduce new features to be identified.



Robot Dog Project

We recently visited the AI lab on campus and were introduced to the UniTree Go2 robot dog they have, and its capabilities. We are talking with Tom King about working on borrowing the robot from them to create a co-bot routine where we program the robot to walk around the lab and perform simple tasks based on natural language input from a human. Tasks would be things like "open X door" or "pick up X object". We would need to order the robotic arm attachment for the dog to be able to have it pick/place objects, but even if that takes a while, we could start with training the robot to walk around the lab without bumping into things.

ROS Robot API

A group of grad Design Patterns students worked on building a ROS-based robot movement API for us, which we will be integrating into our existing systems throughout the winter semester. A team could help with this process if there is work remaining by the Spring, and they could also work on expanding the API's capabilities, like adding functionality for the robots from different OEM, such as Universal and FANUC robots in the lab