AI & DATA ANALYTICS TEAM

Crossing disciplines to bring AI to the fight against cancer
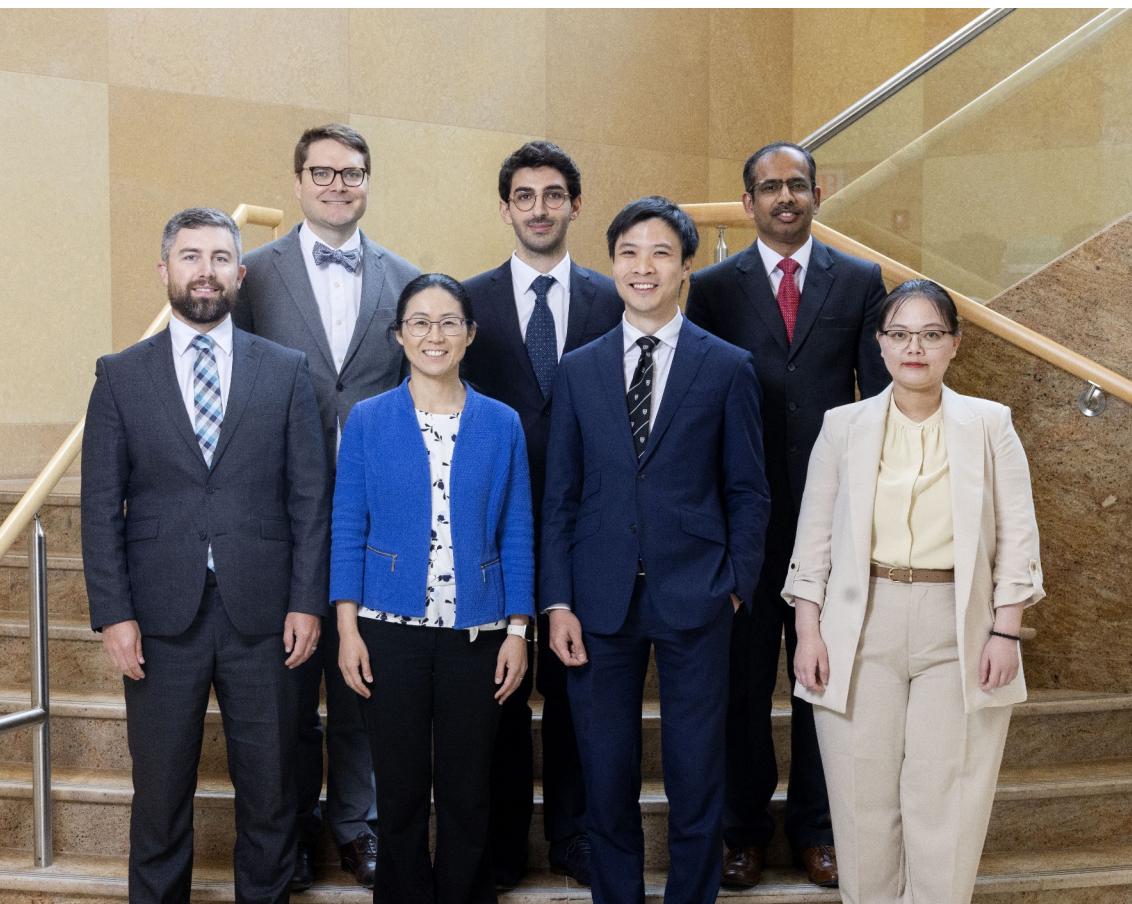
MEET THE TEAM

Artificial intelligence is revolutionizing science and technology. Translating these advances to today's cutting-edge cancer treatments requires a deep understanding of AI, oncology, and physics. To meet this challenge, the Radiation Oncology AI & Data Analytics (AIDA) team was formed in January 2025. The AIDA team is led by a multidisciplinary trio:

MARK WADDLE, M.D. is a radiation oncologist treating genitourinary malignancies. His research focuses on practical applications of AI to healthcare, with a patient-centric approach. He earned his M.D. from the University of North Carolina School of Medicine.

SATOMI SHIRAISHI, PH.D. is a medical physicist with interests in patient outcomes studies, knowledge-based treatment planning, and the safe and effective delivery of proton beam therapy. She earned her PH.D. in Physics from the University of Chicago.

ANDREW FOONG, PH.D. is an AI scientist specializing in deep learning and generative AI. Previously, he worked on generative AI applied to biochemistry at Microsoft Research. He earned his PH.D. in Machine Learning from the University of Cambridge.

The radiation oncology AI & Data Analytics (AIDA) team. Our team brings together AI scientists, radiation oncologists, medical physicists, software engineers, and program managers. We conduct research, conceptualize projects, develop and deploy AI tools to the clinic, and gather feedback to improve them—all within one team.

OUR PROJECTS

The AIDA team prioritizes projects with high clinical impact and a 6–12 month implementation timeframe. Listed below is a small selection of our active work:

PROSTATE CANCER CONTROL TOWER
Catching and treating cancer sooner
DISEASES TARGETED: **prostate cancer**

Prostate cancer is the most common cancer in men. For many men, managing their cancer depends crucially on tracking their *prostate-specific antigen*, or PSA levels. High PSA levels can indicate cancer, but not always. This project uses machine learning models trained on thousands of historical prostate cancer cases to catch cancer early and distinguish true cases from false alarms. These predictions are displayed in a unified dashboard, tracking all prostate cancer cases in the institution and automatically flagging high-risk patients for review—eliminating the possibility of patients being "lost to follow-up."

AI-POWERED RADIATION TREATMENT PLANNING
Better, faster radiation therapy for all
DISEASES TARGETED: pilot focusing on **head & neck cancer** and **prostate cancer**

The need for high-quality radiation treatment far exceeds the number of centers and skilled providers available. A key bottleneck in the treatment process is the development of a treatment plan, which specifies the intensity and direction of the radiation beams targeting the tumor. Recent advances in AI have opened the possibility of automated plan generation and validation, significantly reducing the number of hours required to generate a plan. Beginning with head & neck and prostate cancer, this project will use AI to allow mature treatment centers to treat more patients faster, while enabling under-resourced clinics to deliver world-class radiation therapy by leveraging AI models trained on the highest-quality plans.

ONCOTIMELINE
Empowering clinicians to understand complex patient histories in minutes
DISEASES TARGETED: **all cancers**

The experience of meeting a clinician, only to find that they are under-informed about your clinical history can be disappointingly familiar. Modern clinical practice subjects clinicians to information overload, making it difficult to find key facts when needed, especially in complex oncology cases. The OncoTimeline is a dashboard that uses generative AI to read hundreds of clinical notes and answer clinicians' questions in seconds. Clinicians can specify which kinds of notes they want included, and view summaries in the context of a graphical view of a patient's entire care journey—enabling better-informed care decisions, faster.

The Jacobson Building at Mayo Clinic Rochester where the AIDA team office is based. Our offices are located in the same buildings where hundreds of patients receive state-of-the-art radiation therapies each month. Our close connection with clinical practice allows for rapid feedback and iteration on our AI projects.