



Welcome to the AI in Medicine Extracurricular Track! A unique interdisciplinary initiative offered by the USC School of Medicine and the USC Molinaroli College of Engineering and Computing, supported by the USC Arnold School of Public Health, Joseph F. Rice School of Law, and the USC AI Institute.

Program Overview: Dive into the transformative world of Artificial Intelligence in medicine through our comprehensive, hands-on extracurricular track. This curriculum is designed to equip medical students with a deep understanding of AI's core concepts and its applications in healthcare—from predictive analytics to medical imaging.

What Will You Learn?

- **Fundamentals of AI, Machine Learning, and Data Science**
- **Expert Systems and Decision Trees**
- **Neural Information Processing and Artificial Neural Networks**
- **Training and Testing Neural Networks with Backpropagation**
- **Predictive Analytics and Adapting to New AI Tools**
- **Large Language Models in Healthcare: Beyond Chatbots**
- **Biomarkers, Medical Imaging Meets Deep Learning**
- **Data, Ethics, and the Future Landscape of AI in Medicine**

Curriculum Structure:

- Spanning Years 2 through 4 of medical school, the program provides students with a longitudinal experience that integrates foundational knowledge with clinical application over time.
- Structured series of progressive lectures designed to complement and enhance your medical education, reinforcing core concepts while introducing practical applications and emerging topics in the field of AI in medicine.
- Opportunity to conduct research projects focused on real-world applications, supported by faculty mentorship and with the potential for publication in academic or professional journals

Mentorship and Guidance: Under the expert supervision of Dr. Bonilha and Dr. Valafar, alongside other faculty members from USC AI Institute and Joseph F. Rice School of Law, students will receive tailored mentorship to deepen their understanding and practical skills in both AI applications and AI ethics.

DataCamp Access: Students receive complimentary access to DataCamp, a leading online learning platform that offers interactive courses and resources focused on AI, data science, machine learning, and programming. This valuable resource enables learners to build in-demand technical skills through hands-on exercises, real-world projects, and expert-led instruction. Beyond introductory modules, students will be able to choose which competencies in DataCamp best align with their goals and interests.

Projects: Students have the opportunity to engage in hands-on research projects focused on cutting-edge applications of AI in medicine. These projects span a wide range of topics, including the development of large language models, AI-driven neurological assessments, big data analysis in healthcare, and other collaborative initiatives. These experiences allow students to apply their skills in real-world settings while contributing to meaningful advancements in medical AI.

Year-by-Year Breakdown:

Year 2 (MS2)

- **Fall Semester:**
 - **Lecture 1:** Fundamentals of AI, Machine Learning, and Data Science
 - **Lecture 2:** Expert Systems and Decision Trees
- **Spring Semester:**
 - **DataCamp Online Module 1:** Fundamentals of AI Skill Track Certification
 - **DataCamp Online Module 2:** AI Security and Risk Management

Year 3 (MS3)

- **Fall Semester:**
 - **Lecture 3:** Neural Information Processing and Artificial Neural Networks
 - **Lecture 4:** Training and Testing Neural Networks with Backpropagation
 - **Lecture 5:** Predictive Analytics and Adapting to New AI Tools

- **Spring Semester:**

- **Lecture 6:** Large Language Models in Healthcare: Beyond Chatbots.
- **Lecture 7:** Biomarkers, Medical Imaging Meets Deep Learning

Year 4 (MS4)

- **Fall Semester:**

- **Lecture 8:** Data, Ethics, and the Future Landscape of AI in Medicine.
- **Discussion:** AI's implications on future medical practices and the doctor-patient relationship.

Getting Started:

- **Introductory Lecture:** Given in M1 required course at the end of academic year in the M1 Classroom. An overview of AI in Medicine.
- **Enrollment:** Summer between M1 and M2 years. Limited to 10 students per class based on course performance, CV/Resume, optional MCAT scores, and a passion for AI showcased in an application essay.
- **Application:** REDcap applications open on June 1st and close on June 30th. Decisions will be made before the start of the academic year.

Join Us to Shape the Future of Healthcare with AI! Let AI in Medicine be your pathway to becoming a visionary in healthcare!

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