

**TITLE:**

Modeling Decision Optimization of Perioperative Processes

**FACULTY MENTOR NAME, EMAIL PHONE NUMBER**

Patrick Tighe MD MS

[ptighe@anest.ufl.edu](mailto:ptighe@anest.ufl.edu)

Chris Giordano MD

[cgiordano@anest.ufl.edu](mailto:cgiordano@anest.ufl.edu)

**FACULTY MENTOR DEPARTMENT**

Anesthesiology

**RESEARCH PROJECT DESCRIPTION**

Many facets of common evidence-based medicine practices are unable to account for issues sequential decision making under uncertain conditions. Yet, the need to make series of decisions with incomplete information, but building upon prior experience, remains a cornerstone of medical and surgical practice. In this project, students will explore several common frameworks for optimization of medical decisions generally pertaining to the perioperative environment. Introductory methods will include development of Markov Chain simulations and Markov Decision Process frameworks, with possibility of extending to Q-learning and learning automata. Students will have access to wealth of perioperative data via the IRB-approved Comprehensive Anesthesia Deidentified Dataset. This project is generally oriented towards a student with a math, industrial engineering, economics, or computer science background, although existing tools will enable interested students with a wide range of backgrounds to explore this research domain.