University of Pittsburgh School of Medicine

Artificial Intelligence and Machine Learning in Healthcare Mini-Elective
Spring 2020

Course Dates: January 10, 17, 31, February 7, 14, 21
Fridays, 1:00-3:00 PM

Maximum Students: 30

Class Year: MS1 and MS2

Course Director: Arman Kilic, M.D.
Assistant Professor of Cardiothoracic Surgery

Contact Information:
Arman Kilic, M.D.
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Description:
The aim of **Artificial Intelligence and Machine Learning in Healthcare** is to a provide a global introduction to artificial intelligence (AI) and machine learning (ML) as well as to provide specific examples in healthcare where AI/ML will have expanding use. An overview of AI/ML terminology and algorithms will be provided. Examples of application to healthcare such as predictive analytics, automated imaging interpretation, and natural language processing in the electronic health record will be provided, as will real-world examples of AI/ML in specific fields of medicine.

Course Objectives:
1. To understand the terminology and classifications of AI and ML.
2. To understand how different ML algorithms work, including supervised, un-supervised, and semi-supervised algorithms.
3. To appreciate the role of AI/ML in predictive analytics in healthcare, using real world examples.
4. To appreciate the role of AI/ML in automated imaging interpretation in healthcare.
5. To understand the existing and future roles of AI/ML in natural language processing as it relates to the electronic health record.

Requirements:
Attend all sessions

Pre-Requisites:
None

Texts:
None

COURSE OUTLINE

Artificial Intelligence and Machine Learning in Healthcare
Fridays 1:00PM to 3:00PM, January 10, 17, 31, February 7, 14, 21
Scaife Hall Rooms 422 A&B

Course Director(s):
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Participating Faculty:
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Gilles Clermont, M.D., M.S.
Professor of Critical Care Medicine, Mathematics, Clinical and Transformational Science, and Industrial Engineering
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Panagiotis Benos, Ph.D.
Professor and Vice Chair for Academic Affairs
Department of Computational and Systems Biology
University of Pittsburgh

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SESSION I: January 10, 2020
Introduction to AI and ML
Faculty: Arman Kilic, M.D.
This session will provide a global overview of AI and ML, including its terminology and classification. It will also provide "big picture" insight into the role AI/ML will have in healthcare in the coming years.

SESSION II: January 17, 2020
Overview of Specific ML Algorithms
Faculty: Kyle Miller, Ph.D.
The second session will provide specific descriptions and examples of ML algorithms. Some technical details and advantages/disadvantages of such algorithms will be discussed as well.

SESSION III: January 31, 2020
Application of AI/ML to System-Based Practice in Healthcare
Faculty: Rema Padman, Ph.D.
This session will focus on how AI/ML are being used in systems-based practice in healthcare.

SESSION IV: February 7, 2020
The Role of AI/ML in ICU Care
Faculty: Michael Pinsky, M.D., and Gilles Clermont, M.D., M.S.
This session will provide insight into groundbreaking work on the use of AI/ML in ICU care.

SESSION V: February 14, 2020
The Role of AI/ML in Lung Disease and Lung Cancer
Faculty: Panagiotis Benos, Ph.D.
This session will provide more examples of AI/ML in healthcare, with a focus on its role in chronic lung disease and lung cancer.

SESSION VI: February 21, 2020
Application of AI/ML to Cardiovascular Medicine and Surgery
Faculty: Arman Kilic, M.D.
The concluding session will provide insights into how AI/ML will be used in cardiovascular medicine and surgery. For example, the potential use of ML in helping make multidisciplinary decisions regarding valve choice or stents vs bypass surgery will be discussed.

Texts: None