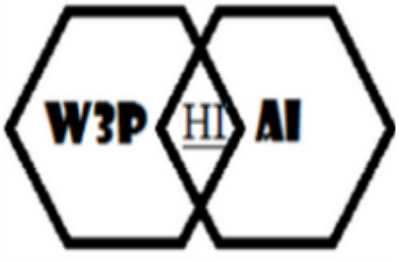

2023 International Workshop on Health Intelligence (W3PHIAI 2023)

Monday, February 13 – Tuesday February 14, 2023

Location: Walter E. Washington Convention Center, Washington DC, USA, all times are EST

Workshop Programme:

DAY 1: February 13, 2023
Time: 8:30am - 5:15 pm EST

8:30 am - 8:45 am
Opening Remarks (Martin Michalowski)

8:45 am - 9:30 am (With Q/A)
(Introduction: Arash Shaban-Nejad)
Keynote Speaker: **Randi Foraker**, Professor of Medicine at the Institute for Informatics (I2), Director of the Center for Population Health Informatics at I2, Washington University in St. Louis, School of Medicine
Title*: Building Trust in AI for Improving Health Outcomes*
Abstract: Given recent digital transformation in healthcare, it is imperative to consider the appropriate application of artificial intelligence (AI). From the perspective of an epidemiologist, this talk will explore the right tasks, the right data, the right evidence standard, and the right approaches for integrating AI into clinical care.

9:30 am - 10:30 am (20 minutes per full, 15 minutes for short presentation)
Session 1: Explainability/Data Integration/Machine Learning (2 full, 1 short presentations)
(Session Chair: Arash Shaban-Nejad)

1. Towards Trust of Explainable AI in Thyroid Nodule Diagnosis
   Authors: *Truong Thanh Hung Nguyen, Van Binh Truong, Vo Thanh Khang Nguyen, Quoc Hung Cao and Quoc Khanh Nguyen*

2. Federated Learning over Harmonized Data Silos
   Authors: *Dimitris Stripelis and José Luis Ambite*

3. Investigation of Drift Detection for Clinical Text Classification (Short)
   Authors: *Hammam Abdelwahab, Claudio Martens, Niklas Beck and Dennis Wegener*

10:30 am - 11:00 am
Break

11:00 am – 12:30 pm (20 minutes per full, 15 minutes for short presentation)
Session 2: Classification (3 full, 1 short presentations)
(Session Chair: Arash Shaban-Nejad)

1. Neural Bandits for Data Mining: Searching for Dangerous Polypharmacy
   Authors: *Alexandre Larouche, Audrey Durand, Richard Khoury and Caroline Sirois*

2. Dynamic Outcomes-Based Clustering of Disease Trajectory in Mechanically Ventilated Patients
   Authors: *Emma Rocheteau, Ioana Bica, Pietro Liò and Ari Ercole*

3. A Time Series Approach to Parkinson's Disease Classification from EEG
   Authors: *Amarpal Sahota, Amber Roguski, Matthew Jones, Michal Rolinski, Alan Whone, Raul Santos-Rodriguez and Zahraa Abdallah*

4. Bayesian-Based Parameter Estimation to Quantify Trust in Medical Devices (Short)
   Authors: *Mini Thomas, Omar Boursalie, Reza Samavi and Thomas E. Doyle*

12:30 pm - 2:00 pm
Lunch Break

2:00 pm - 2:45 pm (With Q/A)
(Introduction: Simone Bianco)
Keynote Speaker: **Morgan Levine**, Founding Principal Investigator at Altos Labs
Title*: Promises, Considerations, and Caveats for Quantifying the biological aging process*
Abstract: Aging is considered the single biggest risk factor for most major chronic conditions, from cancer to Alzheimer's disease. As such, scientists have speculated that identifying interventions to slow or even reverse aging in humans would have massive implications for public health. In addition to the difficulty of identifying such factors, another hurdle is in evaluating the efficacy of any potential intervention. Biological aging is a latent concept and there is no agreed upon method for estimating it. My talk will cover the underlying goals of why we need to develop robust estimates of biological aging; where the field currently stand—particularly in the context of using high-dimensional

omics data—and what considerations and caveats need to be considered as we move forward.

2:45 pm – 3:30 pm
Session 3: W3PHIAI-23 Aging Hackathon I (XXX)
(Session Chair: Simone Bianco)

3:30 pm – 4:00 pm
Break

4:00 pm – 5:00 pm
Session 4: W3PHIAI-23 Aging Hackathon II (XXX)
(Session Chair: Simone Bianco)

5:00 pm – 5:15 pm
Closing remarks – Day 1

DAY 2: February 14, 2023
Time: 8:30am - 4:30 pm EST

8:30 am - 9:15 am (With Q/A)
(Introduction: Martin Michalowski)
Keynote Speaker: **Max Topaz**, Elizabeth Standish Gill Associate Professor of Nursing, Columbia University School of Nursing, Columbia University Data Science Institute
Title*: Artificial Intelligence in Patient's Home: Current Trends and Future Directions*
Abstract: Artificial intelligence technologies are reshaping the way clinical care is provided internationally. This presentation will overview several current trends of artificial intelligence in the patient home with concrete examples of studies currently being conducted to develop and implement a range of technologies in home healthcare settings. The presentation will review examples of automated clinical decision support that helps to identify high-risk patients who should be prioritized for the first home healthcare nursing visits. In addition, the presentation will describe several ways in which deteriorating patients can be identified automatically, using routinely collected home healthcare data. Finally, the presentation will describe cutting-edge speech recognition work to detect patient deterioration, cognitive impairment, and other negative outcomes.

9:15 am – 10:30 am (7 minutes per poster, poster session after presentations)
Poster Session

1. EEG Analysis of Neurodevelopmental Disorders by Integrating Wavelet Transform and Visual Analysis
   Authors: *Soo-Yeon Ji, Sampath Jayarathna, Anne M. Perrotti, Katrina Kardiasmenos and Dong Hyun Jeong*

2. Auditing Algorithmic Fairness in Machine Learning for Health with Severity-based LOGAN
   Authors: *Anaelia Ovalle, Sunipa Dev, Jieyu Zhao, Majid Sarrafzadeh and Kai-Wei Chang*

3. Identification, explanation and clinical evaluation of in-hospital patient subtypes
   Authors: *Enrico Werner, Jeffrey N. Clark, Ranjeet S. Bhamber, Michael Ambler, Christopher P. Bourdeaux, Alexander Hepburn, Christopher J. McWilliams and Raul Santos-Rodriguez*

4. Building precise lung cancer screening system with different data regimes
   Authors: *Adam Pardyl, Dawid Rymarczyk, Zbisław Tabor and Bartosz Zieliński*

5. Automatically Extracting Information in Medical Dialogue: Expert System And Attention for Labelling
   Authors: *Xinshi Wang and Xunzhu Tang*

6. Transfer Learning and Class Decomposition for Detecting the Cognitive Decline of Alzheimer's Disease

Authors: *Maha Alwuthaynani, Zahraa Abdallah and Raul Santos-Rodriguez*

10:30 am - 11:00 am
Break

11:00 am – 12:30 pm (20 minutes per full, 15 minutes for short presentation)
Session 5: Natural Language Processing (2 full, 2 short presentations)
(Session Chair: Arash Shaban-Nejad)

1. Knowledge Augmentation for Early Depression Detection
   Authors: *Hrishikesh Kulkarni, Sean MacAvaney, Nazli Goharian and Ophir Frieder*

2. Deep Annotation of Therapeutic Working Alliance in Psychotherapy
   Authors: *Baihan Lin, Guillermo Cecchi and Djallel Bouneffouf*

3. S_Covid: A Frugal yet Effective Engine to Explore COVID-19 Scientific Literature (Short)
   Authors: *Raj Pranesh and Aditi Pallod*

4. Neural Topic Modeling of Psychotherapy Sessions (Short)
   Authors: *Baihan Lin, Djallel Bouneffouf, Guillermo Cecchi and Ravi Tejwani*

12:30 pm - 2:00 pm
Lunch Break

2:00 pm – 4:00 pm (20 minutes per full, 15 minutes for short presentation)
Session 6: Deep Learning + Social Media (5 full, 1 short presentations)
(Session Chair: Simone Bianco)

1. BAUFER: A Baseline-Enabled Facial Expression Recognition Pipeline Trained With Limited Annotations
   Authors: *Charlotte von Numers, Yinan Yu, Aleksandra Petkova, Emmette Hutchison and Jesper Havsol*

2. Robustness for ECG Classification by Adversarial Training over Clinical Features
   Authors: *Suparshva Jain, Amit Sangroya, Lovekesh Vig and C. Anantaram*

3. A Transformer-based Deep Learning Algorithm to Auto-record Undocumented Clinical One-lung Ventilation Events
   Authors: *Zhihua Li, Alexander Nagrebetsky, Syvia Ranjeva, Nan Bi, Dianbo Liu, Marcos F. Vidal Melo, Timothy Houle, Lijun Yin and Hao Deng*

4. Analyzing the Trends of Responses to COVID-19 Related Tweets from News Stations: An Analysis of Three Countries
   Authors: *Andrew Fisher, Rajesh Sharma and Vijay Mago*

5. Understanding the Role of Questions in Mental Health Support-Seeking Forums (Short)
   Authors: *Aylin Gunal, Ian Stewart, Verónica Pérez-Rosas and Rada Mihalcea*

4:00 pm - 4:30 pm
Closing remarks (Arash Shaban-Nejad)
+ Award Ceremony