Machine learning applications to COVID and Ophthalmology

Jeffrey Chiang, PhD
Department of Computational Medicine
jnchiang@mednet.ucla.edu
Rapid and applied analytics in response to COVID-19
From March to June, 2020, there was …

- Clinical uncertainty
- Potential testing shortage
- Potential resource shortage

- Clinical Disease Dashboard
  - Comorbidities
  - Medications
  - Interventions

Discharge Clinical Characteristics and Post-Discharge Events in Patients with Severe COVID-19: A Descriptive Case Series

Fiyaisal G, Saab MD, Jeffrey N. Chiang PhD, Rachel Brook MD, Paul C. Adamson MD, MPH, Jennifer A. Fulcher MD, PhD, Fran Halperin PhD, Vladimir Manuel MD & David Goodman-Meza MD

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A machine learning algorithm to increase COVID-19 inpatient diagnostic capacity

Goodman-Meza et al., 2020
Projecting hospital resource usage during a surge

Chiang et al., 2020
Short term predictions

One week projections

Two week projections
Ophthalmic biomarker identification using OCT
Age-related Macular Degeneration (AMD)
AMD Diagnosis
AMD Diagnosis via OCT

Normal Aging

High risk of vision loss
Can we automatically identify high-risk features using OCT?
Automatically identifying biomarkers for AMD-risk

Rakocz et al., 2021
Automatically identifying biomarkers for AMD-risk

Rakocz et al., 2021
In progress... Stay tuned!

- Additional biomarkers
- Relating to EHR-defined outcomes
Making all of this possible...

Michael Broudy  Vivek Katakwar  Danielle Belmontez  Andrew Weaver  Albert Duntugan

Vu Vu  Muneeb Wani  Dheeraj Boda  Shital Pandya

Not pictured
Firoz Pathan
Dewan Alam
Yael Berkovich
Shehzad Sheikh
Joycee Berin
And many others who we (I) bother regularly!

OHIA | Office of Health Informatics & Analytics
Clinical and Operations Collaborators

David Goodman-Meza, MD, MAS
Paul Adamson, MD, MPH
Joseph Ebinger, MD
Rachel Brook, MD
Faysal Saab, MD
Jennifer Fulcher, MD, PhD
Vladimir Manuel, MD

Drew Weil, MPH
Scott Jahnke, MBA
Russell Kerbel, MD
Ronald Perez, JD, MSN, RN
Karen Grimley, PhD, MBA, RN

Not pictured
Richard Azar
Robert Cherry, MD
William Dunne, MA
Neil Parikh, MD
And others!
Ophthalmology Collaborators

Srinivas R Sadda, MD
Giulia Corradetti, MD
Liran Tiosano, MD
Muneeswar Nittala, MPhil

Not pictured
Swetha Velaga, MD
Federico Corvi, MD
Ken Marion, MS, MBA
… and many others!
AI in Medicine team

Nadav Rakocz
Ulzee An
Alec Chiu
Mike Thompson
Akos Rudas
Brian Hill
Berkin Durmus
Brunilda Balliu, PhD
Ruth Johnson

Misagh Kordi, PhD
Clifford Kravit
Brandon Jew

Eleazar Eskin, PhD
Eran Halperin, PhD
Sriram Sankararaman, PhD

Not pictured
Bogdan Pasaniuc, PhD (and lab)
Noah Zaitlen, PhD (and lab)
Maxime Cannesson, MD, PhD
Ira Hofer, MD
Eilon Gabel, MD, MS
Timothy Chang, MD, PhD
Elijah Bell, MD
Ryan Kunitake, MD
Elior Rahmani, PhD
And many others!

UCLA Health | UCLA David Geffen School of Medicine | UCLA Computational Medicine
OUR FIELD HAS BEEN STRUGGLING WITH THIS PROBLEM FOR YEARS.

STRUGGLE NO MORE! I’M HERE TO SOLVE IT WITH ALGORITHMS!

SIX MONTHS LATER:
WOW, THIS PROBLEM IS REALLY HARD.
YOU DON’T SAY.