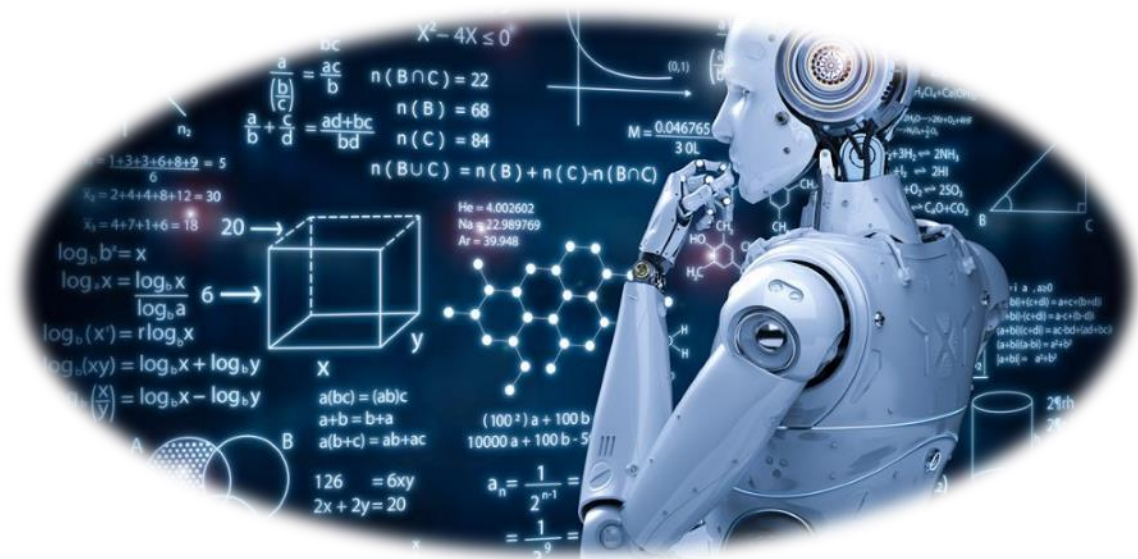


NIH WORKSHOP
ARTIFICIAL INTELLIGENCE HEALTHCARE-
FROM PREVENTION & DIAGNOSTICS TO
TREATMENTS
(αiPDT)



Natcher Conference Center, Building 45,
Ruth Kirschstein Auditorium, NIH Main Campus
Tuesday, October 1, 2019
8:30 am - 5:30 pm

Supported by NIH Artificial Intelligence Interest Group (AIIG), Office of Intramural Research and NIH AI Working Group for Autonomous Therapeutics (AIAT)

ARTIFICIAL INTELLIGENCE HEALTHCARE FROM PREVENTION & DIAGNOSTICS TO TREATMENTS (αίPDT)

Building 45, Ruth Kirschstein Auditorium
Tuesday, October 1, 2019
8:30 am - 5:30 pm

- 08:30 – 09:00 am *Check-in, Networking & Event Snacks*
- 09:00 – 09:10 am** **OPENING CEREMONY: June Lee, MD, Ph.D.**, Chair, NIH Artificial Intelligence Interest Group, and Chair, NIH AI Working Group for Autonomous Therapeutics (NIH). *General Introduction to the Workshop*
- 09:10 - 09:40 am **WELCOME & INTRODUCTION: Susan Gregurick, Ph.D.** Associate Director for Data Science (ADDS) and the Director of the NIH Office of Data Science Strategy (ODSS), (NIH).
- 09:40 - 10:10 am **KEYNOTE ADDRESS: Peter Highnam, Ph.D.**, DARPA Deputy Director, Defense Advanced Research Projects Agency (DARPA): *AI programs at DARPA.*
- 10:10 - 10:40 am **KEYNOTE ADDRESS: Richard M. Satava, MD, FACS**, Professor Emeritus of Surgery, University of Washington Medical Center (UWMC): *AI Based Surgery.*
- 10:40 – 11:00 am *Morning Coffee Break: (Large Group Photo)*
- 11:00 - 11:40 pm** **SESSION 1. AI PREVENTIVE MEDICINE & DIAGNOSTICS**
- 11:00 - 11:10 pm Session Chair and Speaker Introduction: **Elaine Ostrander, Ph.D.** (NIH)
- 11:10 - 11:40 pm **Diana W. Bianchi, M.D.**, Director, Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD): *Opportunities for deep learning in maternal and child health.*
- 11:40 - 12:20 pm** **PANEL DISCUSSION: SECOND AND THIRD WAVE OF AI HEALTHCARE**
Chair: **Gregory D. Hager Ph.D.** (JHU)
- Josh Tenenbaum, Ph.D.** (MIT)
Joseph Frassica, MD (MIT)
Richard M. Satava, MD. (UW)
John Samuel Brownstein, Ph.D. (Harvard)
Tom Goldstein, (UMD)

Vikash Mansinghka (MIT)
Ray Ptucha (RIT)
Michael Black, Ph.D. (MPG.DE)
Thomas M. Siebel, Ph.D. (Stanford)
Ron Dror, Ph.D. (Stanford)
Cynthia Matuszek, Ph.D. (UMBC)
Bart Paulhamus (JHU)

12:20 - 01:00 pm

Lunch Break: (Brown Bag Lunch @ Building 45 Cafeteria)

01:00 - 02:10 pm SESSION 2. AUTONOMOUS THERAPEUTICS

01:00 - 01:10 pm

Session Chair: **Jacqueline Le Moigne, Ph.D.**, Deputy for New Observing Strategy, NASA Goddard Space Flight Center, (NASA): *NASA directions in AI autonomous.*

01:10 - 01:40 pm

June Lee, MD, Ph.D., Chair, NIH Artificial Intelligence Interest Group, Chair, NIH AI Working Group for Autonomous Therapeutics, (NIH) *Autonomous Therapeutics.*

01:40 - 02:10 pm

Bakul Patel, MSEE, MBA, Director, Division of Digital Health, Office of Science of Technology Center for Devices and Radiological Health (FDA) *Artificial Intelligence/Machine Learning (AI/ML)-Based Software as a Medical Device.*

02:10 - 03:00 pm SESSION 3. OPTIMIZING CLINICAL OUTCOME GENERATION

02:10 – 02:20 pm

Session Chair: **Steven A. Anderson, Ph.D., MPP**, Director, Office of Biostatistics and Epidemiology, CBER, (FDA)

02:20 – 02:30 pm

Behrouz N. Shabestari, Ph.D., Acting Director, Division of Health Informatics Technologies (NIBIB)

02:30 – 02:40 pm

C. Norman Coleman, MD, Associate Director, Radiation Research Program (NCI)

02:40 – 02:50 pm

Karlie R. Sharma, Ph.D., Program Officer, National Center for Advancing Translational Sciences (NCATS)

02:50 – 03:00 pm

Cynthia Matuszek, Ph.D., Assistant professor, computer science and electrical engineering, (UMBC)

03:00 - 03:20 pm

Afternoon Coffee Break

03:20 - 04:20 pm **SESSION 4. OPTIMIZING CLINICAL EVIDENCE GENERATION**

03:20 – 03:30 pm Session Chair: **Sameer Antani, Ph.D.**, Acting Chief, Communications Engineering Branch, and Computer Science Branch, (NLM)

03:30 – 03:40 pm **Berkman Sahiner, Ph.D.**, Senior Biomedical Research Scientist at the US Food and Drug Administration, (FDA) *AI in medical imaging and briefly outline some of the related research at the FDA*

03:40 – 03:50 pm **Susan Gregurick, Ph.D.**, Director of the former NIGMS Division of Biophysics, Biomedical Technology, and Computational Biosciences, (NIGMS). *NIGMS & Artificial Intelligence*

03:50 – 04:00 pm **Gregory D. Hager, Ph.D.**, Director, Malone Center for Engineering in Healthcare and Mandell Bellmore Professor, (JHU)

04:00 – 04:10 pm **Ceferino Obcemea, PhD**, Program Director in Medical Physics, (NCI)

04:10 – 04:20 pm **Francisco Pereira, Ph.D.** Director, Machine Learning Team, (NIMH)

04:20 – 04: 40 pm **Fatima Paruk, MD MPH**, Chief Medical Innovation Officer, Microsoft Corporation

04:40 – 05:25 pm **PANEL DISCUSSION: AI FOR INTELLIGENT HEALTHCARE MISSION AUTONOMY** (*topics: therapeutic master algorithm sets, automatic therapeutic systems, biomarker and marker sets, sensor networks, therapeutic robots and robot network*) Panel Chair: **Gregg Cohen, Ph.D.** (NIH)

Fatima Paruk, M.D, MPH (Microsoft)

David Feinberg, M.D (Google Health)

Peter Dolan (DeepMind, Google)

John Hebel (Lockheed Martin)

Graham Katz (IBM Watson)

John Calhoun (Amazon AWS)

Larry Brown (NVIDIA)

James A. Bednar (Anaconda)

Jyotirmaya Nanda, (Intelligent Automation)

Leo Grady, Ph.D. (Paige.AI)

Jason Bhan, M.D (Prognos)

Adam Hanina (AICure)

05:25 - 05:30 pm **ADJOURN: June Lee, MD, Ph.D.** Chair, NIH Artificial Intelligence Interest Group, Chair, NIH AI Working Group for Autonomous Therapeutics and Clinical Pharmacologist/ Program Director (NICHD)

05:30 - 06:00 pm *Networking*

Supported by NIH Artificial Intelligence Interest Group (AIIG), Office of Intramural Research and NIH AI Working Group for Autonomous Therapeutics (AIAT)

The workshop is free and open to the public, and is designed for researchers, practitioners, and other professionals interested in ARTIFICIAL INTELLIGENCE HEALTHCARE.

Reservation required: <http://www.123formbuilder.com/form-5003877/workshop-registration-form>

Videocast available: <https://videocast.nih.gov/summary.asp?live=34643>

Homepage: <https://datascience.nih.gov/news/artificial-intelligence-healthcare-oct-1-2019>

Cafeteria: Building 45 Cafeteria Hours of Operation: 6:30 a.m. to 2:30 p.m.

Parking: We strongly encourage taking the Metro to the Natcher Conference Center. There are very few visitor parking spaces at the NIH. There is a three-hour limit on visitor parking spaces, and ticketing is enforced. The Natcher Conference Center is a 5-minute walk from the Medical Center station on the Red Line.

The Natcher Building is located on Center Drive directly behind the Medical Center Stop. The Conference will take place at the National Institutes of Health, Natcher Conference Center, Atrium (entry level) and Auditorium (lower level) at 45 Center Drive, Bethesda, MD 20852.

NIH Campus Parking Map

http://www.ors.od.nih.gov/pes/dats/parking/Pages/parking_info.aspx

Washington Metrorail Map

<http://www.wmata.com/rail/maps/map.cfm>

If you must drive, take the Wisconsin Avenue exit from the Capital Beltway (Rte 495) and go 1.5 miles south on Wisconsin Avenue toward Bethesda to the 5th traffic light at Center Drive/Jones Bridge Rd. Turn right onto NIH Gateway Drive. The Natcher Building is at 45 Center Drive and is located across from the Library of Medicine.

An alternative parking at NIH is to drive to Bethesda and park in a public lot in Bethesda. From Bethesda you can either take the Metro (stop is located at East West Highway and Wisconsin Ave.) to the Medical Center Stop or walk up Wisconsin Avenue to Center Drive (about a 10-15 minute walk). You may also drive and park at other Metro Stops on the Red Line that have public parking and take the Metro to the Medical Center station. Convenient stops include Rockville, White Flint and Grosvenor.

AI Workshop Science & Organization Committee

Government

- June Lee, MD, Ph.D., Chair (NIH)
- Amy Abernethy, Co-Chair (FDA)
- Lawrence A. Tabak, D.D.S., Ph.D. (NIH)
- Peter Highnam, Ph.D. (DARPA)
- Susan Gregurick, Ph.D. (NIH)
- Jacqueline Le Moigne, Ph.D. (NASA)
- C. Norman Coleman, MD (NIH)
- Sameer Antani, Ph.D. (NIH)
- Ronald M. Summers, MD, PhD (NIH)
- Gregg Cohen, Ph.D. (NIH)
- Francisco Pereira, Ph.D. (NIH)
- Behrouz N. Shabestari, Ph.D. (NIH)
- Ceferino Obcemea, PhD, (NIH)
- Steven A. Anderson, Ph.D., MPP (FDA)
- Bakul Patel, MSEE, MBA (FDA)
- Berkman Sahiner, Ph.D. (FDA)
- Donna L. Mendrick, Ph.D. (FDA)

Academia

- Josh Tenenbaum, Ph.D. (MIT)
- Joseph Frassica, MD (MIT)
- Vikash Mansinghka Ph.D. (MIT)
- Richard M. Satava, MD. (UW)
- John Samuel Brownstein, Ph.D. (HMS)
- Gregory D. Hager, Ph.D. (JHU)
- Thomas M. Siebel, Ph.D. (Stanford)
- Ron Dror, Ph.D. (Stanford)
- Greg Zaharchuk, Ph.D. (Stanford)
- Tom Goldstein, Ph.D. (UMD)
- Bart Paulhamus (JHU)
- Dinesh Manocha, Ph.D. (UMD)
- Cynthia Matuszek, Ph.D. (UMBC)
- Ray Ptucha, Ph.D. (RIT)
- Anil Deane, Ph.D. (UM)
- Hadi Amiri, Ph.D. (Harvard)
- Michael Black, Ph.D. (MPG.DE)

Private Sector

- Demis Hassabis (DeepMind, Google) / Peter Dolan
- Fatima Paruk, M.D, MPH (Microsoft)
- Alice Powers (Amazon)
- Andy Conrad, Ph.D. (Verily)
- John Calhoun, (Amazon)
- Jeffrey Dean, Ph.D. (Google)
- Allison Thomas Rodriguez, (Microsoft)
- Graham Katz, (IBM Watson)
- James A. Bednar, (Anaconda)
- John Hebel, (Lockheed Martin)

- Jyotirmaya Nanda, (Intelligent Automation)
- Larry Brown, (NVIDIA)
- Leo Grady, PhD, (Paige.AI)
- Peter McCaffrey, MD, (VastBiome)

Local Organizing Committee

- June Lee, MD, Ph.D. (NIH) Science & Technical Coordination
- Donna L. Mendrick, Ph.D. (FDA) Science & Technical Coordination
- Ronald M. Summers, MD, PhD, (NIH Clinical Center) Science & Technical Coordination
- Christopher Wanjek, Director of Communications (NIH)
- Laura Stephenson Carter, Editor-in-Chief, (The NIH Catalyst)
- Terry A. Kerere, CMP, Conference and Event Manager, (FAES)
- Lisa C. Rogers, (FAES), Event support, (FAES)
- Carolyn McCain-Stanford, NIH Conference Specialist Supervisor
- Mary H. Conway, Conference Specialist
- Joy Jackson Farrar, Video Producer
- Erin Walker, Webpage Support
- Chiachi Chang, Photographer
- AI Generated Music Composed by AIVA