Pacific Symposium on Biocomputing (PSB) 2024 Schedule
January 3-7, 2024 Big Island of Hawaii

## Tuesday, January 2, 2024

### Registration
| | | |
|---|---|---|
| 4:00-6:00 | Registration | Ballroom Prefunction |

## Wednesday, January 3, 2024

### Registration
| | | |
|---|---|---|
| 7:30-9:00 | Registration | Ballroom Prefunction |
| 12:00-1:30 | Registration | Ballroom Prefunction |

### Workshop #1 & #2 — Plaza Ballroom
| | |
|---|---|
| 9:00-12:00 | **Statistical Analysis of Single-Cell Protein Data** |
| | Organizer: Brooke Fridley |
| 1:30 - 4:30 | **Tools for assembling the cell: Towards the era of cell structural bioinformatics** |
| | Organizers: Emma Lundberg, Trey Ideker, Andrej Šali |

### Break
| | |
|---|---|
| 12:00-1:30 | Lunch on own |

### Workshop #3 & #4 — Salon 2&3
| | |
|---|---|
| 9:00- 12:00 | **Risk prediction: Methods, Challenges, and Opportunities** |
| | Organizers: Rui Duan, Lifang He, Ruowang Li, Jason H. Moore |
| 1:30-4:30 | **Practical Approaches to Enhancing Fairness, Social Responsibility and the Inclusion of Diverse Viewpoints in Biomedicine** |
| | Organizers: Daphne O. Martschenko, Nicole Martinez-Martin, Meghan Halley |

### Reception — Croquet Lawn
| | |
|---|---|
| 5:00-6:00 | Opening Reception – light appetizers |
| | Sponsored by the Cleveland Institute for Computational Biology |

### Dinner
| | |
|---|---|
| 6:00- | Dinner on own |

*Please wear your PSB name tag and lanyard for admission to all events and hosted meals.*

*January 06, 2024*

## Thursday, January 4, 2024

| | | |
|---|---|---|
| **Registration** | | |
| 7:30-9:30 | Registration | Ballroom Prefunction |
| 11:30-1:30 | Registration | Ballroom Prefunction |
| **Breakfast** | | **Ballroom Courtyard** |
| 7:30-8:45 | PSB Breakfast | |
| **Welcome** | | **Salon 2&3** |
| 8:45-9:00 | Welcome – Teri Klein | |

**Session 1**                                                                                          **Salon 2&3**

**Artificial Intelligence in Clinical Medicine: Generative and Interactive Systems at the Human-Machine Interface**

Co-chairs: Jonathan Chen, Roxana Daneshjou, David Ouyang, Emma Pierson, Ivana Jankovic, Sajjad Fouladvand

| | |
|---|---|
| 9:00-9:10 | Introduction |
| 9:10-9:25 | *Clinfo.ai: An Open-Source Retrieval-Augmented Large Language Model System for Answering Medical Questions using Scientific Literature* <br> <u>Alejandro Lozano</u>, Scott L Fleming, Chia-Chun Chiang, Nigam Shah |
| 9:25-9:40 | *A Conversational Agent for Early Detection of Neurotoxic Effects of Medications through Automated Intensive Observation* <br> <u>Serguei Pakhomov</u>, Jacob Solinsky, Martin Michalowski, Veronika Bachanova |
| 9:40-9:55 | *Leveraging 3D Echocardiograms to Evaluate AI Model Performance in Predicting Cardiac Function on Out-of-Distribution Data* <br> <u>Grant Duffy</u>, Kai Christensen, David Ouyang |
| 9:55-10:10 | *BrainSTEAM: A Practical Pipeline for Connectome-based fMRI Analysis* <br> <u>Alexis Li</u>, Yi Yang, Hejie Cui, Carl Yang |
| 10:10-10:25 | *MaTiLDA: An Integrated Machine Learning and Topological Data Analysis Platform for Brain Network* <br> <u>Katrina Prantzalos</u>, Dipak Upadhyaya, Nassim Shafiabadi, Guadalupe Fernandez-BacaVaca, Nick Gurski, Kenneth Yoshimoto, Subhashini Sivagnanam |
| 10:25-10:40 | *Zoish: A Novel Feature Selection Approach Leveraging Shapley Additive Values for Machine Learning Applications in Healthcare* <br> <u>Hossein Javedani Sadaei</u>, Salvatore Loguercio, Mahdi Shafiei Neyestanak, Ali Torkamani |
| 10:40-10:55 | *SynTwin: A graph-based approach for predicting clinical outcomes using digital twins derived from synthetic patients* <br> <u>Jason H. Moore</u>, Xi Li, Jui-Hsuan Chang, Nicholas P. Tatonetti, Dan Theodorescu, Yong Chen, Folkert W. Asselbergs, Mythreye Venkatesan, Zhiping Paul Wang |
| 10:55-11:10 | *Optimizing Computer-Aided Diagnosis with Cost-Aware Deep Learning Models* <br> <u>Charmi Patel</u>, Yiyang Wang, Thiruvarangan Ramaraj, Roselyne Tchoua, Jacob Furst, Daniela Raicu |

| | | |
|---|---|---|
| **Break** | | |
| 11:10-11:20 | Break | |
| **Keynote** | | **Salon 2&3** |
| 11:20-12:30 | ***The Age of Phenomics*** <br> Scott Penberthy with introduction by Teri Klein | |
| **Lunch** | | **Ballroom Courtyard** |
| 12:30-1:30 | PSB Hosted Lunch | |
| **Discussion Session** | | **Salon 2&3** |
| 1:30-2:30 | **Artificial Intelligence in Clinical Medicine: Generative and Interactive Systems at the Human-Machine Interface** | |

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## Thursday, January 4, 2024 (continued)

| Workshop #5 | | Salon 2&3 |
|---|---|---|
| 2:30-5:30 | **Large Language Models (LLMs) and ChatGPT for Biomedicine** | |
| | Organizers: Zhiyong Lu, Steven Brenner, Cecilia Arighi | |

| Dinner | |
|---|---|
| 5:30- | Dinner & Evening on own |

## Friday, January 5, 2024

| Registration | Ballroom Prefunction |
|---|---|
| 7:30-8:30 | Registration |

| Breakfast | Ballroom Courtyard |
|---|---|
| 7:30-8:30 | PSB Breakfast |

| Announcements | Salon 2&3 |
|---|---|
| 8:30-8:40 | Morning Announcements – Marylyn Ritchie |

| TERI Talks | Salon 2&3 |
|---|---|
| 8:40-9:10 | Karen Ebert Matthys, Stanford University |
| 9:10-9:40 | Alex Morgan, Khosla Ventures |

**Session 2** — Salon 2&3

**Overcoming Health Disparities in Precision Medicine**
Co-chairs: Kathleen Barnes, Francisco De La Vega, Keolu Fox, Alexander Ioannidis, Eimear Kenny, Rasika Mattias, Bogdan Pasaniuc

| | |
|---|---|
| 9:40-9:50 | Introduction |
| 9:50-10:10 | Invited Talk: Chris Gignoux, University of Colorado |
| 10:10-10:25 | *PopGenAdapt: Semi-Supervised Domain Adaptation for Genotype-to-Phenotype Prediction in Underrepresented Populations* <br> Marçal Comajoan Cara, Daniel Mas Montserrat, Alexander G. Ioannidis |
| 10:25-10:40 | *LA-GEM: imputation of gene expression with incorporation of Local Ancestry* <br> Mrinal Mishra, Layan Nahlawi, Yizhen Zhong, Tanima De, Guang Yang, Cristina Alarcon, Minoli A Perera |
| 10:40-10:55 | *Cluster Analysis reveals Socioeconomic Disparities among Elective Spine Surgery Patients* <br> Alena Orlenko, Philip J. Freda, Attri Ghosh, Hyunjun Choi, Nicholas Matsumoto, Tiffani J. Bright, Corey T. Walker, Tayo Obafemi-Ajayi, Jason H. Moore |
| 10:55-11:10 | *Evidence of recent and ongoing admixture in the U.S. and influences on health and disparities* <br> Hannah M. Seagle, Jacklyn N. Hellwege, Brian S. Mautz, Chun Li, Yaomin Xu, Siwei Zhang, Dan M. Roden, Tracy L. McGregor, Digna R. Velez Edwards, Todd L. Edwards |
| 11:10-11:25 | *Evaluating the relationships between genetic ancestry and the clinical phenome* <br> Jacqueline A. Piekos and Jeewoo Kim, Jacob M. Keaton, Jacklyn N. Hellwege, Todd L. Edwards and Digna R. Velez Edwards |

| Discussion Session | Salon 2&3 |
|---|---|
| 11:25-12:25 | **Overcoming Health Disparities in Precision Medicine** |

| Poster Session Lunch | Salon 1 and Ballroom Courtyard |
|---|---|
| **12:25-2:30** | **Poster Session with Lunch** |
| *12:25-1:45* | *Food Available* |
| *1:00-1:45* | *Posters on ODD numbered boards presented* |
| *1:45-2:30* | *Posters on EVEN numbered boards presented* |

**Session 3** — **Salon 2&3**

**Digital health technology data in biocomputing: Research efforts and considerations for expanding access**
Co-chairs: Michelle Holko, Jessilyn Dunn, Chris Lunt, Eric Hurwitz

| | |
|---|---|
| 2:30-2:45 | Introduction |
| 2:45-3:00 | Invited Talk: Eric Hurwitz |
| 3:00-3:15 | *Expanding the access of wearable silicone wristbands in community-engaged research through best practices in data analysis and integration* <br> Lisa M. Bramer, Holly M. Dixon, David J. Degnan, Diana Rohlman, Julie B. Herbstman, Kim A. Anderson, Katrina M. Waters |

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## Friday, January 5, 2024 (continued)

| Session 3 | | Salon 2&3 |
|---|---|---|
| 3:15-3:30 | *Subject Harmonization of Digital Biomarkers: Improved Detection of Mild Cognitive Impairment from Language Markers* | |
| | Bao Hoang, Yijiang Pang, Hiroko Dodge, Jiayu Zhou | |
| 3:30-3:45 | *Scalar-Function Causal Discovery for Generating Causal Hypotheses with Observational Wearable Device Data* | |
| | Valeriya Rogovchenko, Austin Sibu, Yang Ni | |

| Discussion Session | | Salon 2&3 |
|---|---|---|
| 3:45-4:45 | **Digital health technology data in biocomputing: Research efforts and considerations for expanding access** | |

| Awards | | Salon 2&3 |
|---|---|---|
| ~~4:45-5:15~~ | ~~**Parasite Awards**~~ | |

| Dinner | |
|---|---|
| 5:15- | Dinner & Evening on own |

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## Saturday, January 6, 2024

<table>
<tr><td><strong>Breakfast</strong></td><td style="text-align:right"><strong>Ballroom Courtyard</strong></td></tr>
<tr><td>7:30-8:30</td><td>PSB Breakfast</td></tr>
</table>

<table>
<tr><td><strong>Announcements</strong></td><td style="text-align:right"><strong>Salon 2&3</strong></td></tr>
<tr><td>8:30-8:40</td><td>Morning Announcements – Russ Altman</td></tr>
</table>

<table>
<tr><td><strong>TERI Talks</strong></td><td style="text-align:right"><strong>Salon 2&3</strong></td></tr>
<tr><td>8:40-9:10</td><td>Michelle Whirl-Carrillo, Stanford University</td></tr>
<tr><td>9:10-9:40</td><td>Sean Mooney, University of Washington</td></tr>
</table>

**Session 4** <span style="float:right">**Salon 2&3**</span>

**Precision Medicine: Innovative methods for advanced understanding of molecular underpinnings of disease**

Co-chairs: Yana Bromberg, Hannah Carter, Steven E. Brenner

| | |
|---|---|
| 9:40-9:50 | Introduction |
| 9:50-10:10 | Invited Talk: William Noble, University of Washington |
| 10:10-10:25 | *Enhancing Spatial Transcriptomics Analysis by Integrating Image-Aware Deep Learning Methods*<br>Jiarong Song, Josh Lamstein, Vivek Gopal Ramaswamy, Michelle Webb, Gabriel Zada, Steven Finkbeiner, David W. Craig |
| 10:25-10:40 | *Spatial Omics Driven Crossmodal Pretraining Applied to Graph-based Deep Learning for Cancer Pathology Analysis*<br>Zarif L. Azher, Michael Fatemi, Yunrui Lu, Gokul Srinivasan, Alos B. Diallo, Brock C. Christensen, Lucas A. Salas, Fred W. Kolling IV, Laurent Perreard, Scott M. Palisoul, Louis J. Vaickus, Joshua J. Levy |
| 10:40-10:55 | *Potential to Enhance Large Scale Molecular Assessments of Skin Photoaging through Virtual Inference of Spatial Transcriptomics from Routine Staining*<br>Gokul Srinivasan, Matthew J. Davis, Matthew R. LeBoeuf, Michael Fatemi, Zarif L. Azher, Yunrui Lu, Alos B. Diallo, Marietta K. Saldias Montivero, Fred W. Kolling IV, Laurent Perrard, Lucas A. Salas, Brock C. Christensen, Thomas J. Palys , Margaret R. Karagas, Scott M. Palisoul, Gregory J. Tsongalis, Louis J. Vaickus, Sarah M. Preum, Joshua J. Levy |
| 10:55-11:10 | *PEPSI: Polarity measurements from spatial proteomics imaging suggest immune cell engagement*<br>Eric Wu, Zhenqin Wu, Aaron T. Mayer, Alexandro E. Trevino, James Zou |
| 11:10-11:25 | *KombOver: Efficient k-core and K-truss based characterization of perturbations within the human gut microbiome*<br>Nicolae Sapoval, Marko Tanevski, Todd J. Treangen |
| 11:25-11:40 | *nSEA: n-Node Subnetwork Enumeration Algorithm Identifies Lower Grade Glioma Subtypes with Altered Subnetworks and Distinct Prognostics*<br>Zhihan Zhang, Christiana Wang, Ziyin Zhao, Ziyue Yi, Arda Durmaz, Jennifer S. Yu, Gurkan Bebek |
| 11:40-11:55 | *Application of quantile discretization and Bayesian network analysis to publicly available cystic fibrosis data sets*<br>Kiyoshi Ferreira Fukutani, Thomas H. Hampton, Carly A. Bobak, Todd A. MacKenzie, Bruce A. Stanton |
| 11:55-12:10 | *Deconvolution of Nascent Sequencing Data Using Transcriptional Regulatory Elements*<br>Zachary Maas, Rutendo Sigauke, Robin Dowell |
| 12:10-12:25 | *Splitpea: quantifying protein interaction network rewiring changes due to alternative splicing in cancer*<br>Ruth Dannenfelser, Vicky Yao |

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## Saturday, January 6, 2024 (continued)

| Awards | Salon 2&3 |
|---|---|
| 12:25-12:55 | **Parasite Awards** |

| Lunch | |
|---|---|
| 12:55-2:00 | Lunch on Own (Networking Time) |

| Discussion Session | Salon 2&3 |
|---|---|
| 2:00-3:15 | **Precision Medicine: Innovative methods for advanced understanding of molecular underpinnings of disease** |

| Break | |
|---|---|
| 3:15-5:30 | Afternoon on Own (Networking Time) |

| Dinner | Coconut Grove |
|---|---|
| 5:30-7:25 | PSB Dinner Banquet |

| Keynote | Coconut Grove |
|---|---|
| 7:25-8:30 | ***Machine Accusers: The Right to Confront Witnesses in an Age of AI*** |
| | Andrea Roth with introduction by Russ Altman |

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## Sunday, January 7, 2024

| Breakfast | Ballroom Courtyard |
|---|---|
| 7:30-8:30 | Breakfast |

| Closing | Salon 2&3 |
|---|---|
| 8:30-8:40 | Closing Announcements – Larry Hunter |

| Session 5 | Salon 2&3 |
|---|---|

**Drug-repurposing and discovery in the era of "big" Real-World Data: how the incorporation of observational data, genetics, and other -omic technologies can move us forward**

Co-chairs: Todd Edwards, Nikhil Khankari, Jacklyn Hellwege, Marijana Vujkovic, Megan Shuey

8:40-8:50     Introduction

8:50-9:05     *Systematic Estimation of Treatment Effect on Hospitalization Risk as a Drug Repurposing Screening Method*
Costa Georgantas, Jaume Banus, Roger Hullin, Jonas Richiardi

9:05-9:20     *Transcript-aware analysis of rare predicted loss-of-function variants in the UK Biobank elucidate new isoform-trait associations*
Rachel A. Hoffing, Aimee M. Deaton, Aaron M. Holleman, Lynne Krohn, Philip J. LoGerfo, Mollie E. Plekan, Sebastian Akle Serrano, Paul Nioi, Lucas D. Ward

9:20-9:35     *Generating new drug repurposing hypotheses using disease-specific hypergraphs*
Ayush Jain, Marie-Laure Charpignon, Irene Y. Chen, Anthony Philippakis, Ahmed Alaa

9:35-9:50     *Combined kinome inhibition states are predictive of cancer cell line sensitivity to kinase inhibitor combination therapies*
Chinmaya U. Joisa, Kevin A. Chen, Samantha Beville, Timothy Stuhlmiller, Matthew E. Berginski, Denis Okumu, Brian T. Golitz, Michael P. East, Gary L. Johnson, Shawn M. Gomez

9:50-10:05    *Creation of a Curated Database of Experimentally Determined Human Protein Structures for the Identification of Its Targetome*
Armand Ovanessians, Carson Snow, Thomas Jennewein, Susanta Sarkar, Gil Speyer, Judith Klein-Seetharaman

10:05-10:20   *Modeling Path Importance for Effective Alzheimer's Disease Drug Repurposing*
Shunian Xiang, Patrick J. Lawrence, Bo Peng, ChienWei Chiang, Dokyoon Kim, Li Shen, Xia Ning

| Discussion Session | Salon 2&3 |
|---|---|
| 10:20-11:20 | **Drug-repurposing and discovery in the era of "big" Real-World Data: how the incorporation of observational data, genetics, and other -omic technologies can move us forward** |

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*PSB over--see you next year!*

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*January 06, 2024*