2020 MATH + X Symposium on Inverse Problems and Deep Learning, Mitigating Natural Hazards

Las Catalinas, Guanacaste, Costa Rica · January 29–31

Agenda

**Wednesday, January 29**
Santarena, The Conservatory

6:30am  breakfast, Ponciana

8:15am opening remarks de Hoop, Jenkins, Protti

8:30am  Keynote: Modeling Sea Ice in a Changing Climate Golden

9:30am Large Neural Networks Beyond the Kernel Regime Bruna

10:15am coffee/juice break

10:45am Anticipation of Large Subduction Earthquakes in Costa Rica Protti

11:15am Volcanic Activity in Costa Rica Pacheco

11:30am  spotlights: Seydoux, Ratti, Bueno Rodriguez

11:45am Recovery of Material Parameters in Transversely Isotropic Media Vasy

12:30pm lunch, Limonada

3:30pm coffee/juice break

**Chair: de Hoop**

4:00pm  Retrieving Robust Noise-based Seismic Velocity Changes from Sparse Data Sets Shapiro

4:45pm  Keynote: Mathematics of Deep Learning Vidal

5:45pm  Earth System Modeling 2.0: Toward Data-Informed Climate Models With Quantified Uncertainties Schneider

**Chair: Uhlmann**
Thursday, January 30
Santarena, The Conservatory

6:30am  breakfast, Ponciana

Chair: van der Hilst

8:30am  Keynote: Watching and Listening to Fractures
         Weitz

9:30am  Fast Discovery of Pairwise Interactions in High Dimensions Using Bayes
         Broderick

10:15am  coffee/juice break

10:45am  New Deep Neural Networks Solving Nonlinear Inverse Problems
         Lassas

11:30am  spotlights: Moliter, Balestriero, Railo

11:45am  Tsunamis Warning and Submerged Volcanic Activity Monitoring: Deep Learning and
         New Detection Techniques
         Chierici

12:30pm  lunch, Limonada

3:30pm  coffee/juice break

Chair: Johnson

4:00pm  Keynote: Tackling Challenges in Flood Forecasting with Machine Learning
         Nevo

5:00pm  Inverse Spectral and Resonance Problems for Elastic Surface Waves
         Iantchenko

5:45pm  coffee/juice break

6:15pm  Supershear Earthquakes and Tsunamis
         Bhat

7:00pm  Robust and Interpretable Blind Image Denoising via Bias-free Convolutional Neural
         Networks
         Fernandez-Granda

7:45pm  adjourn

8:00pm  symposium dinner, Limonada 2nd floor

Friday, January 31
Santarena, The Conservatory

6:30am  breakfast, Ponciana

Chair: Ramirez

8:30am  Keynote: Extreme Event Quantification in Dynamical Systems with Random Compo-
         nents
         Vanden-Eijnden

9:30am  How Many Seismic Observables Do We Need to Forecast Volcanic Eruptions? A New
         Approach Using AI in Volcano Seismology
         Ibanez

10:15am  coffee/juice break
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<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
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<tr>
<td>10:45am</td>
<td>Finite Element Methods for Unique Continuation</td>
<td>Oksanen</td>
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<td>11:30am</td>
<td><strong>spotlights:</strong> Nguyen, Gutiérrez, Begland</td>
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<td>11:45am</td>
<td>Machine Learning Identifies Universal Fault Friction Characteristics</td>
<td>Johnson</td>
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<td>12:30pm</td>
<td>lunch, Limonada</td>
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<td>3:30pm</td>
<td>coffee/juice break</td>
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<td>4:00pm</td>
<td>Deep Generative Approaches to Help Mitigate Climate Change</td>
<td>Schmidt</td>
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<td>4:45pm</td>
<td>The Geometry of Anisotropy</td>
<td>Ilmavirta</td>
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<td>5:30pm</td>
<td>Cloud Storage Applications of Algebraic Surfaces via Coding Theory</td>
<td>Várilly-Alvarado</td>
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<td>6:15pm</td>
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<td>7:00pm</td>
<td>dinner, Limonada</td>
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