Subsurface Data Science Inaugural Workshop
October 7, 2019

Location: TRESIDDER MEMORIAL UNION OAK ROOM
495 LAGUNITA DRIVE
STANFORD UNIVERSITY

Morning Program

8:00 – 8:30  CONTINENTAL BREAKFAST

8:30  Welcoming remarks  Naomi Boness
8:35  Stanford School of Earth, Energy and Environmental Sciences  Steve Graham
8:50  Overview of Stanford Subsurface Data Science  Biondo Biondi
9:10  Developing an intelligent agent for subsurface uncertainty quantification  Jef Caers
9:30  Use of deep learning-based modeling in history matching and production optimization  Lou Durlofsky
9:50  How machine learning can help with seismic imaging  Biondo Biondi
10:10  Value of information in reservoir forecasting: A simulation-regression approach  Tapan Mukerji

10:30  BREAK

10:50  ROUNDTABLE WORKING SESSION - Getting past the buzz words: How can Stanford collaborate with our partners to maximize the academic and business potential of data science?
  • What are some real examples of how machine learning or AI have added value?
  • What are the major hurdles and obstacles for realizing big value from big data? Are they related to technology, business applications or a lack of organizational understanding and alignment?
  • What are some ways to leverage data science skills/expertise across Stanford research groups?
  • How could Stanford better partner with external companies and organizations to identify areas for collaboration and joint research projects?
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11:45  LUNCH

Applied Data Science: Guest presentations from two Stanford startups  
Kelvin Inc. and Ondaka

Afternoon Program

12:45  Machine learning for understanding petroleum systems  
Allegra Hosford Scheirer

13:05  Physics informed machine learning for uncertainty quantification of subsurface flow dynamics  
Hamdi Tchelepi & Daniel Tartakovsky

13:25  Imaging the groundwater systems of California: Integration of remote sensing and geophysical data  
Rosemary Knight

13:45  Deep neural networks to predict multi-phase flow in porous media  
Sally Benson

14:05  BREAK

14:25  Detection and modeling of subsurface deformation in the Permian Basin using InSAR  
Karissa Pepin

14:45  Using data science to validate geomechanics models in unconventional reservoirs  
Mark Zoback

15:05  Machine learning for improved analysis of natural and induced seismicity  
Greg Beroza/ Mostafa Mousavi

15:25  BREAK

15:40  ROUNDTABLE WORKING SESSION - Data Science Talent: Supply and Demand

• How could this community enhance the education of millennials interested in Subsurface Data Science?
• What Data Science talent do you need? How do you find the right people? How do you retain them?
• What do you think is the role of academia in Data Science? How much of Data Science is a “science” to be taught vs. a craft to be practiced?
• How can we foster collaboration between Stanford graduates, Stanford startups, current Stanford research groups, and external companies?

16:20  Summary and Discussion

17:00 – 19:00  RECEPTION