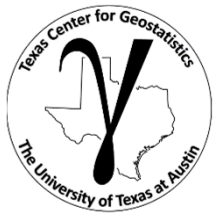
Multivariate Modeling
Geostatistical Subsurface Modeling



Lecture outline . . .

- **Summary**
- **Plus / Delta**

Introduction

Data Analytics

Inferential Methods

Predictive Methods

Advanced Methods

Conclusions

Instructor: Michael Pyrcz, the University of Texas at Austin

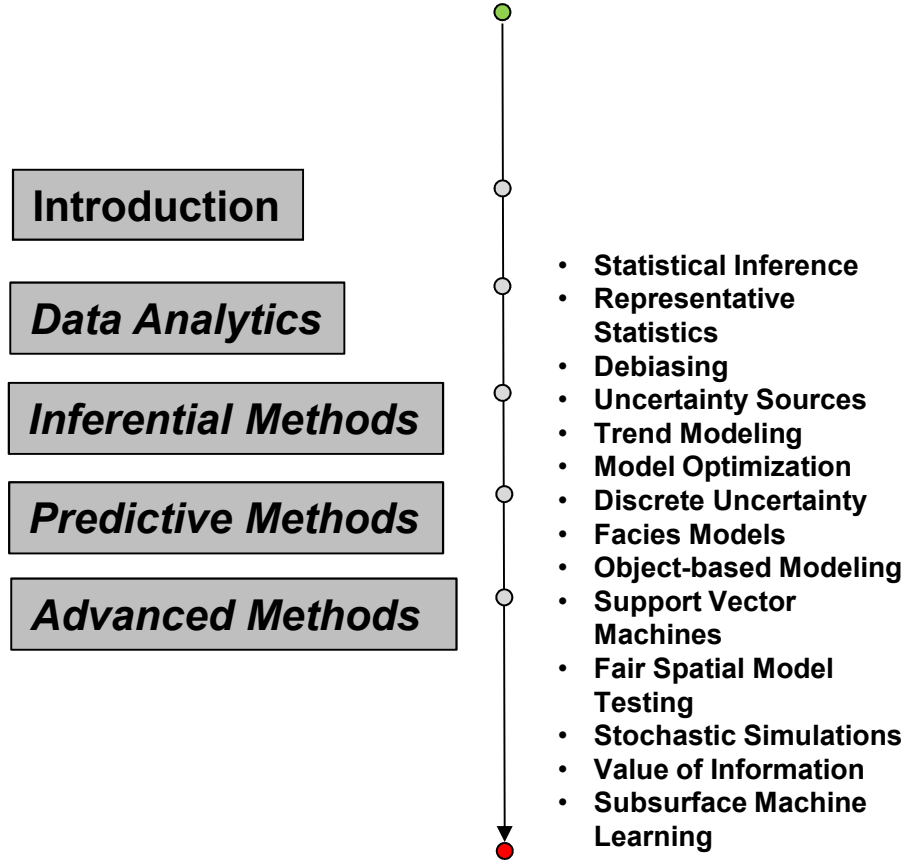
Summary

Today's building blocks can be reimplemented and expanded to address various other problems, opportunities.

There is much more that we could cover and opportunities for workflow review and development etc.

I hope this was helpful.
I'm happy to assist,

Michael



Subsurface Data Analytics and Machine Learning

Opportunities

Opportunity for Academia to Support Industry

Subsurface data analytics and machine learning consortium.

Kick-off meeting hosted by Anadarko June 12th in The Woodlands, TX.

Several companies committed to join.

DIRECT: **DI**gital **RE**servoir **C**haracterization **T**echnology

Industrial Affiliates Proposal

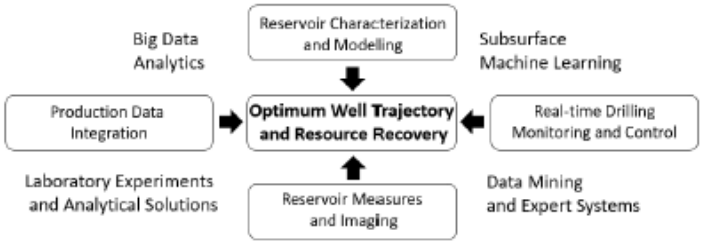
Michael J. Pyrcz[1], John Foster[1,2], Carlos Torres-Verdín[1], and Eric van Oort[1]

1- Hildebrand Department of Petroleum & Geosystems Engineering, the University of Texas at Austin

2 – Institute for Computational Engineering and Science, the University of Texas at Austin

Opportunity

Recent numerical developments and improved computational resources have led to a rapid expansion of big data analytics and machine learning implementations. Oil and gas has a long history with big data from seismic surveys, production monitoring along with various other remote sensing and well-based data, and has developed various physics-based engineering and stochastic statistical workflows. There is an opportunity to combine best-practice and cutting-edge technology in reservoir spatiotemporal characterization and modeling, production data integration, reservoir geophysics and real-time drilling control with big data analytics and machine learning to optimize well trajectory and resource recovery.



Optimum well trajectory and resource recovery through integration of engineering, data analytics, and machine learning.

The hydrocarbon industry requires high-resolution, integrated physics-and geology-based and data-driven, real-time updateable models that are cost-effective, interpretable, efficient, and reliable for production-oriented optimum decision-making, for both conventional and unconventional resources.

This **DIRECT** industrial affiliates program, based in the Hildebrand Department of Petroleum and Geosystems Engineering, at the University of Texas at Austin, will work to develop these integrated modeling and decision support systems to solve the following outstanding problems:

- **Integration**: Maximizing the integration of deterministic engineering, geological description, target-oriented drilling, geophysical measurements, borehole formation evaluation, production history and core data to construct high-resolution reservoir models for improved production forecast accuracy.
- **Characterization:** Improving the spatial resolution of reservoir description and modeling based on enhanced data integration for improved development decision-making.
- **Grey Box Modeling**: Development of big data analytics and machine learning methods that fully account for geospatial and engineering knowledge.

Plus / Delta

Plus:

1.

Delta:

1.

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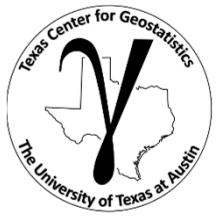

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