Informatics-directed Engineering of Soft Materials

Zou Research Lab @ USF

Make transformative impact on soft material processing & sustainability

Welcome

As the principal investigator I welcome all students and researchers with diverse backgrounds to join my research team at USF! I will make several commitments to guide and support each team-member towards attainment of fulfilling careers and lives. Together we will build a vibrant group characterized by innovation, open-mindedness and mutual respect.

About Dr. Zou

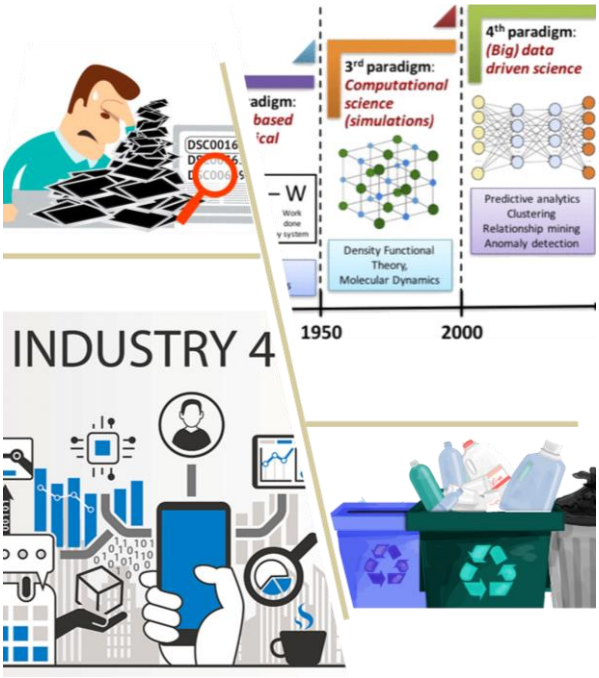
Post-doctoral researcher, **MIT**
Ph.D. Chemical Engineering, **U. Michigan**
M.S. Chemical Engineering, **U. Michigan**
B.S. Petroleum Engineering, **China U. Petroleum**

When I'm not doing science

Hiking, swimming, ice-skating, fishing, …

Science, technology & me

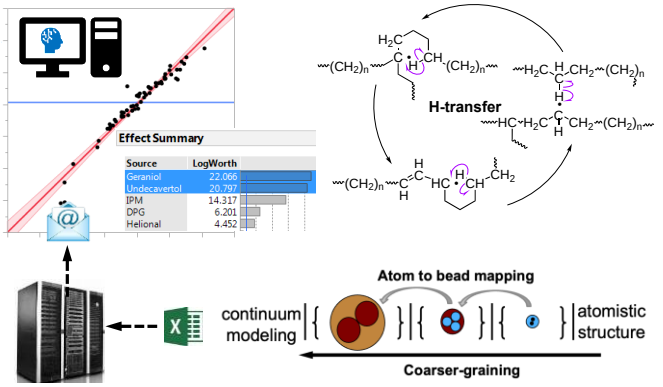
Mathematical model to predict climate change
AI to HR and project management
Book chapter on oil storage & transportation
Summer visiting at P&G
Data scientist & software development



Research vista

To date, our science and technology have entered an era where innovations are powered by data-driven tools. Meanwhile, our chemical industries are embracing for a low-carbon, highly automated future.

To contribute rewarding solutions to a more sustainable and digitalized world, we will deploy interdisciplinary technologies to empower soft material innovations in chemistry and processing through the integration of first-principle theories, multi-scale modelling, advance characterizations as well as informatics and data science.

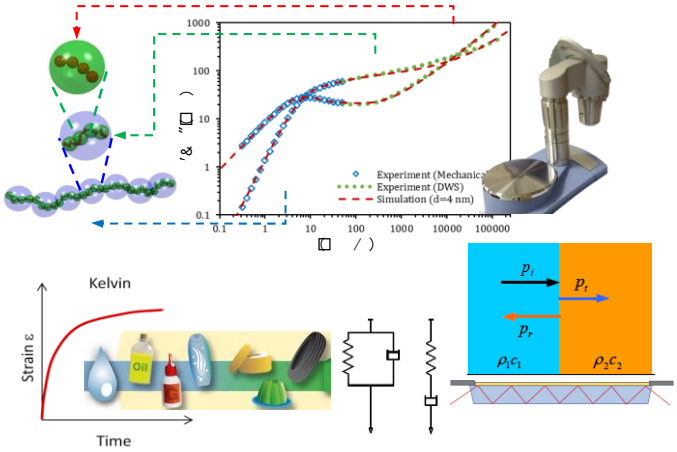


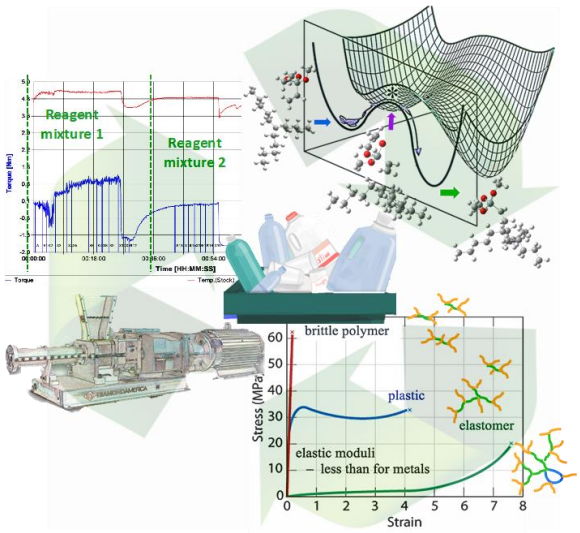
Machine-aided material innovation

We will combine chemical informatics with computational chemistry and physical modelling to estimate the macroscopic properties of soft materials. This will be further supported by the establishment of automated computation and data analysis system while ML algorithm and AI can be implemented for real time simulations.

Rheology informatics

We will "teach" computer rheology. This can be achieved by devising high throughput measurements for machine recognition. The correlation between chemical informatics and the associated rheology identities will provide fundamental insight for applications of complex soft materials in food engineering, soft robotics and formulation science.





Polymer circularity

Our research will aim at driving the design and production of commercial thermoplastics for better recyclability. While to maximize the reuse of plastics in the market, we will deliver technologies to enhance efficiency in identify multi-waste stream as well as manufacturing prototype with a high tolerance to impurities and variations among feedstocks.

Smart processing

We will bridge different levels of computation on complex fluids to enable on-line control of soft material processing. A machine-aided multi-physics and chemistry simulator will be constructed for quick response in industrial applications, such as additive manufacture, with fast and accurate predictions on flow and reaction outcomes under various conditions.