Robotic High Throughput Rheology Platform

VTIP 20-049 “A Sensor-Based High Throughput Characterization Rheology Platform”

THE CHALLENGE
Current gel material characterization techniques are low throughput, present barriers to process integration, and are limited regarding the frequency range over which rheological properties can be characterized. As a result, they limit the pace of materials discovery, thus shifting the paradigm of material characterization towards the use of automated platforms. Automation is needed to eliminate such bottlenecks and significantly accelerate the pace of materials discovery.

OUR SOLUTION
Virginia Tech researchers in the department of Industrial and Systems Engineering have developed a novel robotically guided platform for high-throughput characterization of liquids and gels in well-plate formats. This invention will shift the paradigm of rheology analysis toward the high-throughput workflows associated with bioanalysis. The innovative platform can provide material characterization for applications including screening and development of products with viscoelastic properties, sol-gel phase transitions, bioanalysis of engineered tissues and gel-based products, fundamental rheology, and characterization of gelatin processes for molecular and material development/discovery. This invention has the potential to achieve rapid development of new high performance materials.

Photos at multiple levels of magnitude of the novel automated high-throughput Rheology platform.