Applied Controls Research

The Alleyne Research Group (ARG) works at the intersection of theoretical control, dynamic modeling and simulation, and hardware-based experimental validation by applying a wide variety of control techniques to solve important societal problems.

What we do & where we are going

Theory

- Theory is central to the development of novel control techniques, and the Alleyne Research Group (ARG) utilizes various forms of control theory to advance control in many different fields.

Simulation

- MATLAB/Simulink is used extensively to develop and test controllers prior to implementation on hardware.
- ARG has developed many toolsets over the years, several of which are actively used in industry.

Experimentation

- ARG is home to several energy system and manufacturing experimental platforms. New experimental systems are developed frequently and students have access to many platforms within the lab and the school of engineering.

Developing Great Research and Great People

- Start with an important problem.
- Understand the system dynamics.
- Develop control theory.
- Validate via simulation and experimentation.
- Develop novel control techniques.
- High-Impact Research.
- Career Development.
- ARG Community.
- Collaborations with Industry.
- Careers in Industry.
- Careers in Academia.

E-Jet Printing

Electrohydrodynamic Jet Printing

Roll-to-Roll E-Jet System

E-jet printing is a technique that uses electric fields to fabricate high throughput, decrease costs, and enable printing on flexible substrates.

Desktop E-Jet Printer with Multisyringe

- Printing are being pursued because of its potential for patterning applications.
- Combined with a range of material inks that can be used to fabricate high structures with feature sizes down to 4,2 mm.