



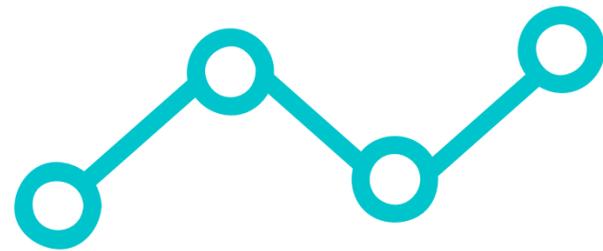
BYU PRISM GROUP

Process Research and Intelligent Systems Modeling



BYU PRISM

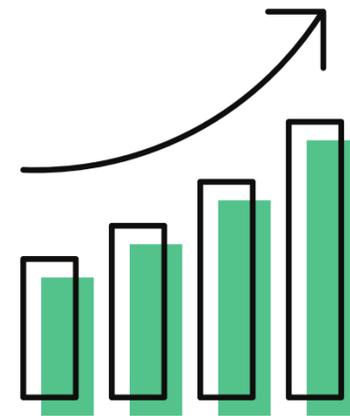
The BYU PRISM group maintains GEKKO, an object-oriented Python library that facilitates model construction, analysis tools, and visualization of simulation and optimization. More information is available at machinelearning.byu.edu



Model

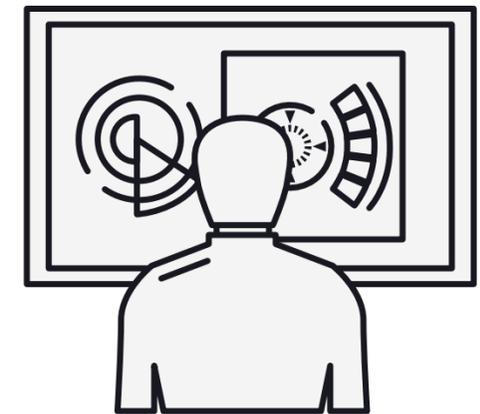
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NSF Award #1547110



Optimize

- Machine Learning
- Data reconciliation
- Real-time optimization
- Digital twin dynamic simulation
- Moving horizon estimation
- Model predictive control



Control

Hundreds of industrial applications:
Cogeneration, Drilling automation,
Severe slugging control, solar
thermal energy production, solid
oxide fuel cells, flow assurance,
enhanced oil recovery, essential oil
extraction, unmanned aerial vehicles,
food and beverage, pulp and paper,
and more.

Experiential Learning

The BYU PRISM group conducts research in methods and applications of **control systems, optimization, and machine learning.**

Many companies work with a graduate student by **sponsoring a research project with a graduate student fellowship** or a sponsored research contract. Graduate students work closely with companies to research and apply the latest machine learning methods. **Many join the sponsoring company upon graduation.**



How we capture value

**Innovative
Research
(Journal
Publications)**

**Extended
network of
industrial
connections.**

**Scalable projects
that usually lead
to internal
development of IP**

**Extended range
of applications.**

**Hands-on
experience**

Talent acquisition

**Internships / full
time offers.**

**University
resources (labs,
faculty, etc)**

**Cutting edge
research.**

How we deliver value

Recent Examples

RCC : Digital Transformation for the mining industry.

- Cutting edge developments in the area of machine learning for plant monitoring and optimization.
- Proof of concept projects that are further developed by the company as Intellectual Property (IP).

Private funding (33k/yr - 1 graduate student)



Recent Examples

C-UAS : Intelligent monitoring using drones.

- 3 journal publications in 2020
- Fully functional iOS App (not public)
- Enhanced monitoring of equipment by 50% (savings of up to 50% in time and resources used to monitor equipment).
- Access to research from other member universities.

C-UAS (Center for Unmanned Aerial Systems - \$60k/yr)



Other forms of collaboration

Class Project

- **< 5k USD**
- **1-3 Months**
- **Proof of concept type of projects**
- **Undergraduate lead**

PRISM Project

- **5 -20k USD**
- **4-12 Months**
- **Application projects**
- **Undergraduate lead w/ graduate support.**

PRISM Project Graduate

- **33 - 50k USD**
- **12 + Months**
- **Research and application projects**
- **Graduate lead w/ undergraduate support**

PRISM Consortium

- **Annual membership (\$ TBD)**
- **12 + Months**
- **Research and application projects**
- **Graduate lead w/ undergraduate support**
- **Multi-disciplinary collaboration.**

Contact

Samuel Arce

Research Assistant - BYU | Chemical Engineering

385-2199684

samuelarce@byu.edu

www.linkedin.com/in/sam-arce

