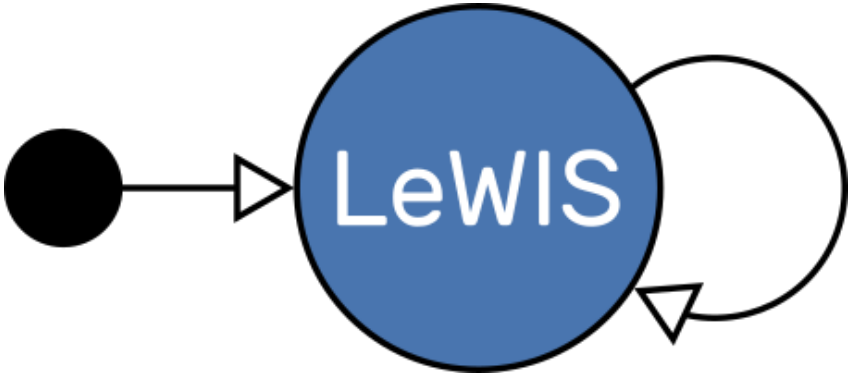
Introduction to…



A Stateful Device Emulation Framework

Michael Hart
Michael Wedel
Owen Arnold

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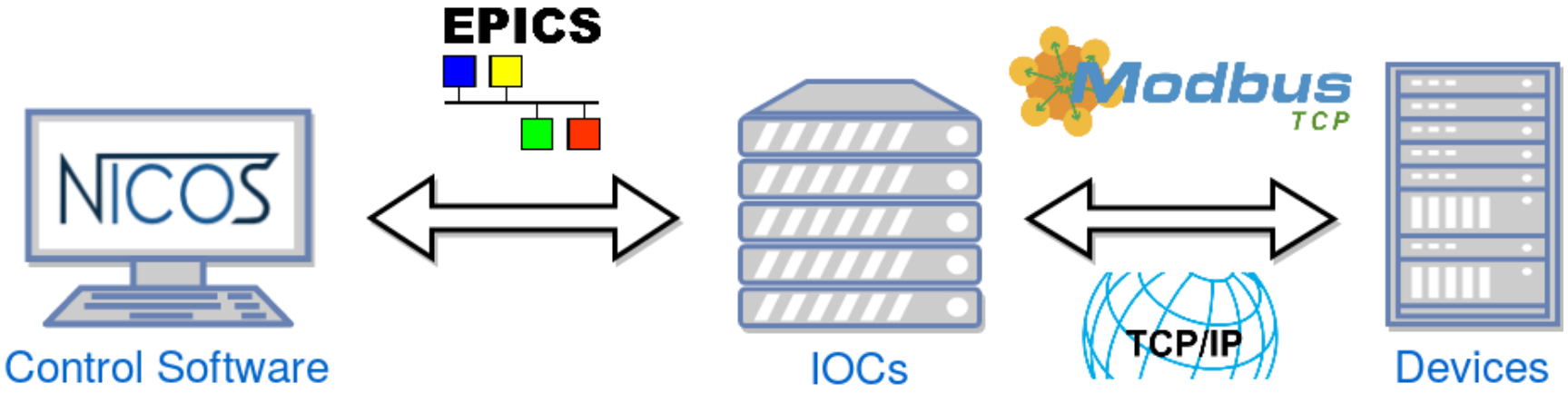
Background

- Need to develop user-facing control software



ESS Artist Rendition

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ESS Reality

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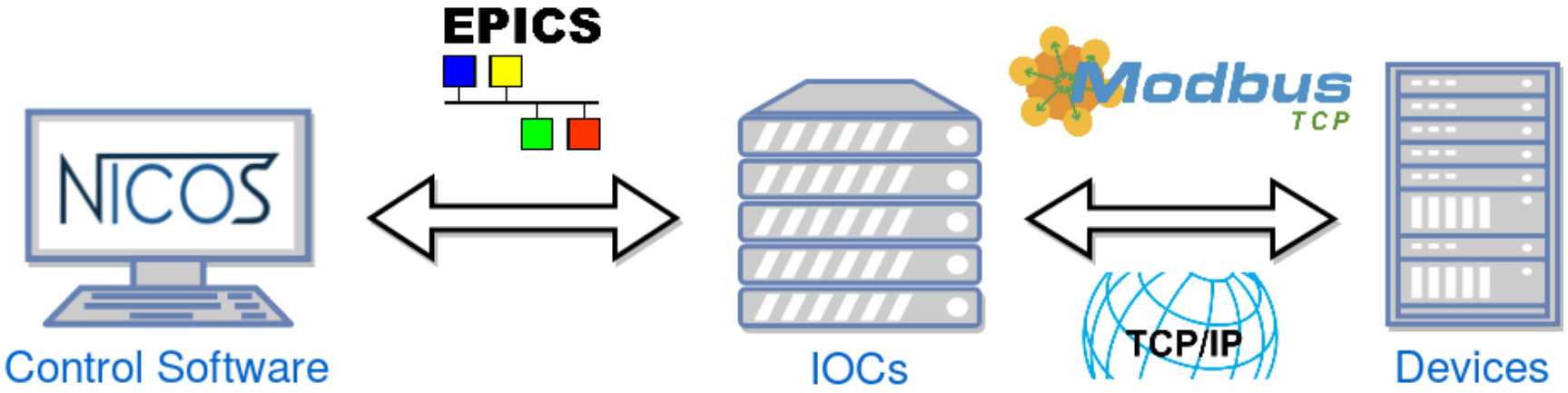
Background

- Need to develop user-facing control software
- BUT….
  - Facility does not exist yet
  - Hardware not available yet
  - EPICS IOCs not available yet
  - Cannot test our work

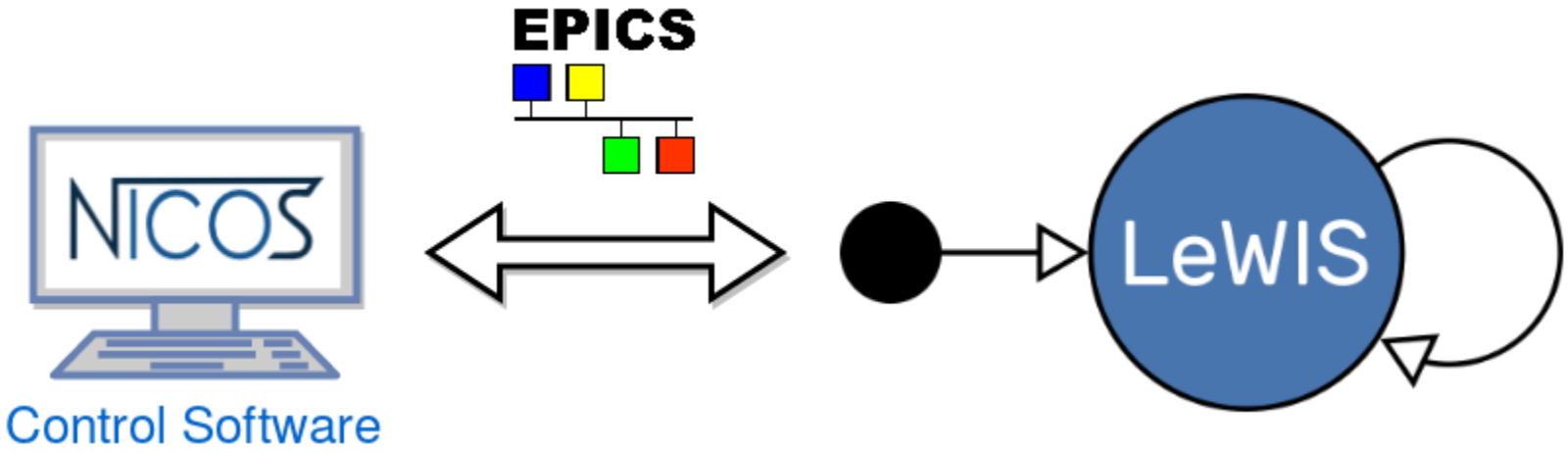
Solution

- Replace Devices + IOCs with software emulator



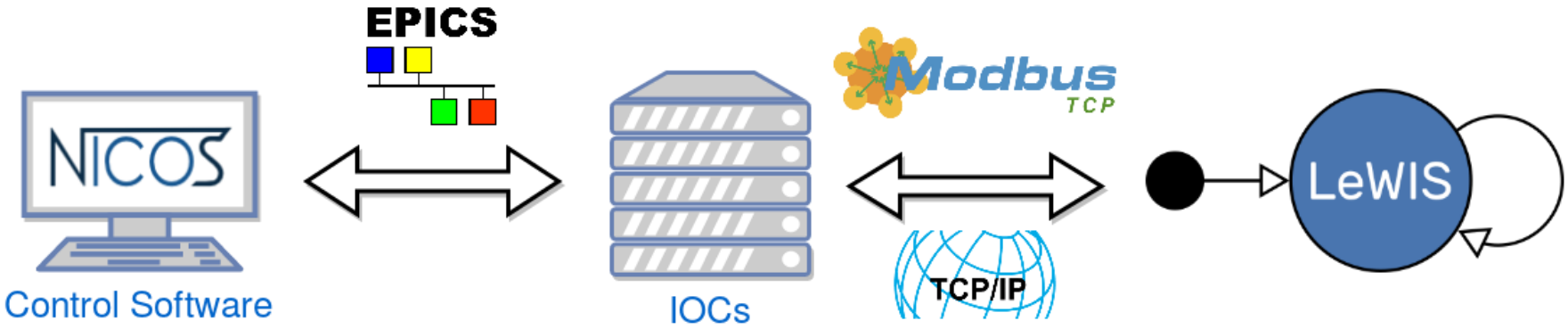
Replace IOC

- Replace devices + IOCs with Lewis

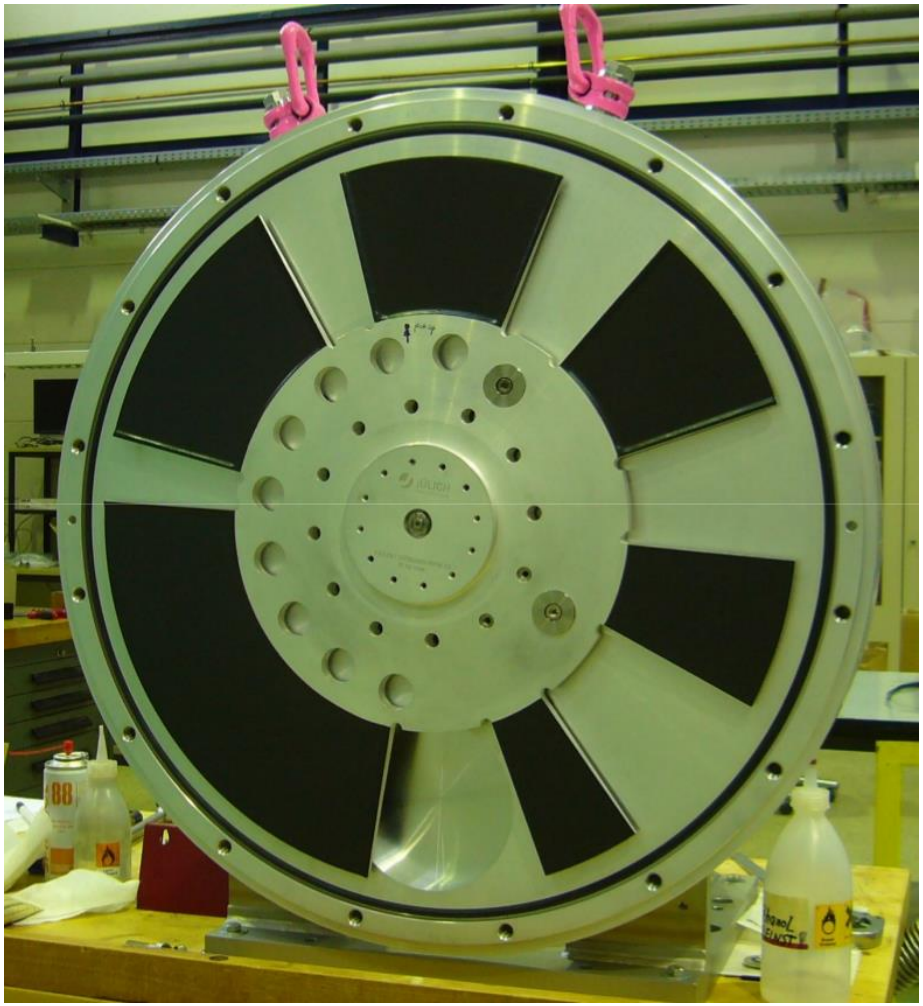


Replace Device

- Replace devices with Lewis



Chopper Disc



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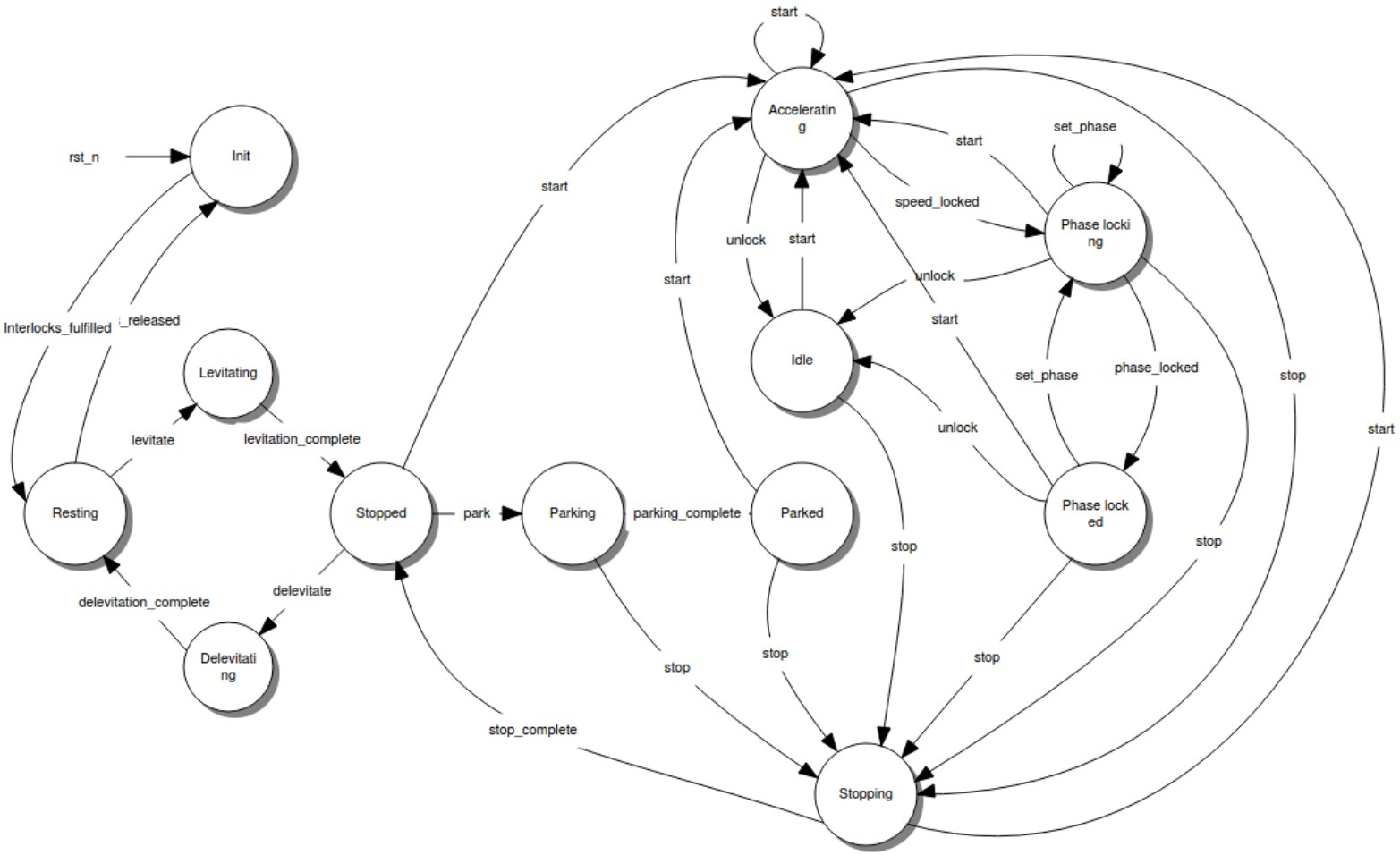
Chopper State Diagram



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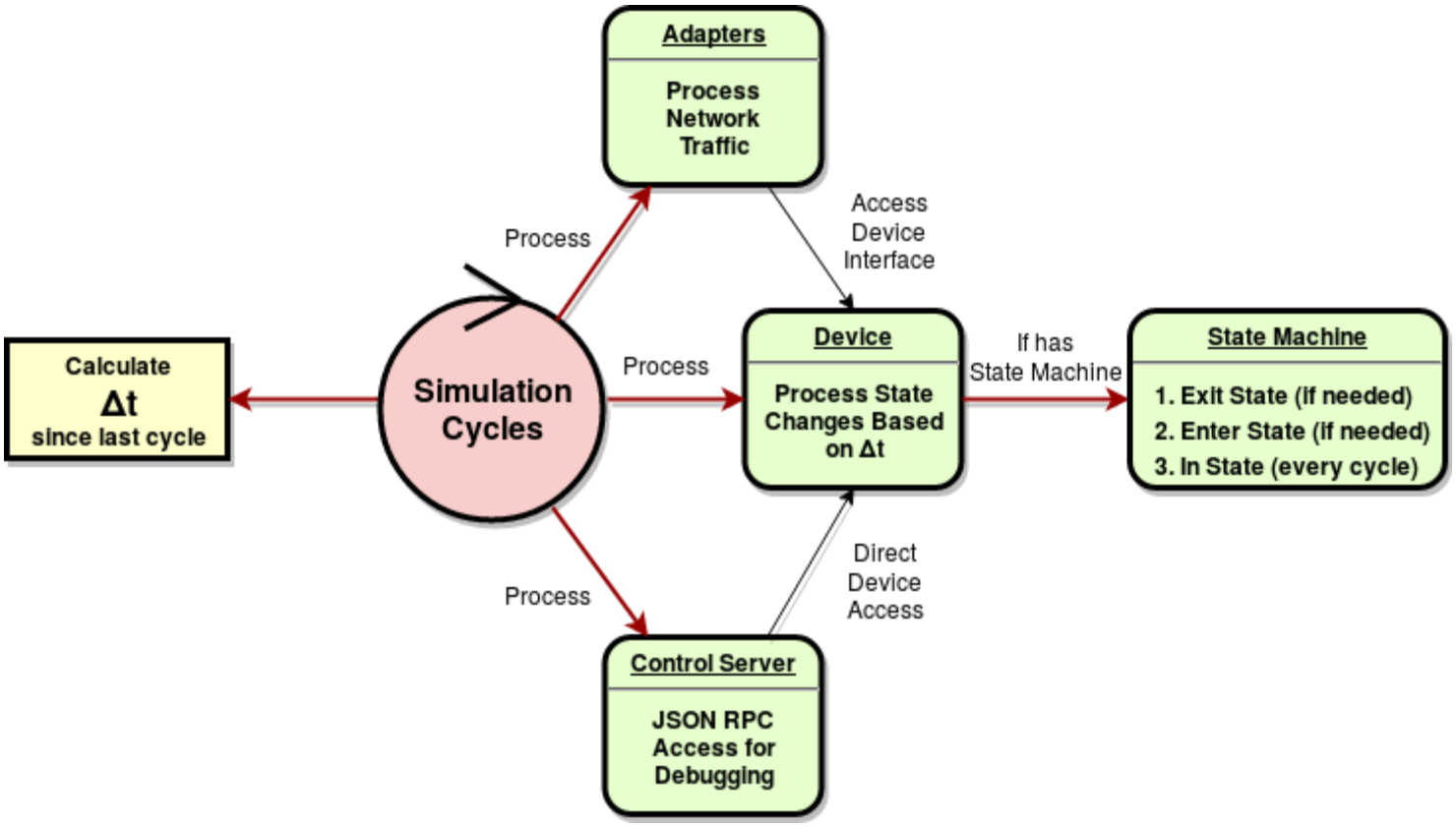
Lewis Overview

- Python framework to unify common tasks
- State machine to model device states
- Flexible interfaces: IOC or Device-level
- Cycle-driven: Deterministic and controllable time-flow
- JSON-RPC to bypass normal protocol
- Available as Docker image

Lewis Cycle-Driven Design



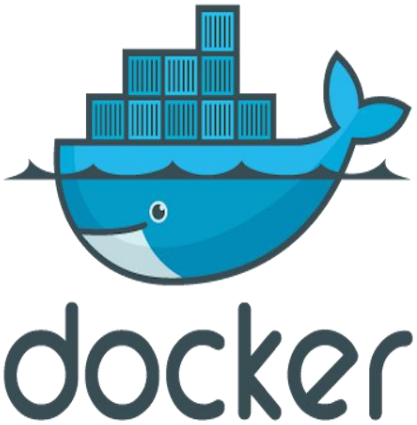
Use Cases and Applications

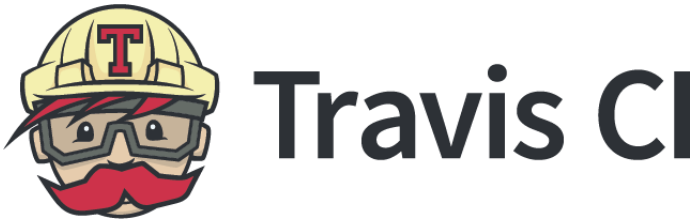
- Development and testing of user-facing software without access to hardware
- Allows testing edge conditions without stressing or jeopardizing hardware
- Automated unit and system tests
- Can be used to perform dry runs to test or time user scripts
- Can be used in many other contexts!

Current State

- Version 1.0.3 released March 24th 2017
- Helped progress Chopper design at ESS
- In use at ESS Test Beamline at HZB in Berlin
- In use by IBEX team here at ISIS
  - Device-level emulators
  - Test IOC and GUI behaviour

Lewis Technologies





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Where to find Lewis

- GitHub
  - https://github.com/DMSC-Instrument-Data/lewis
- DockerHub
  - https://hub.docker.com/r/dmscid/lewis/
- PyPI
  - https://pypi.python.org/pypi/lewis
- Install!
  - `$ pip install lewis`
  - `$ docker pull dmscid/lewis`

Questions

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