Sirepo: Domain-Rich Computational Physics Gateway

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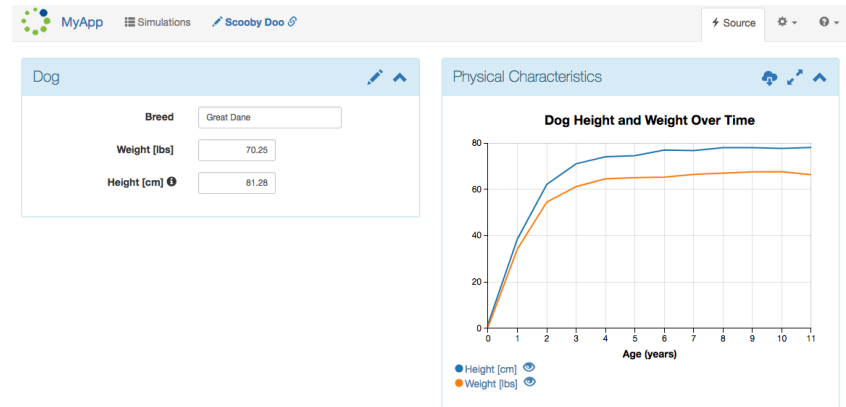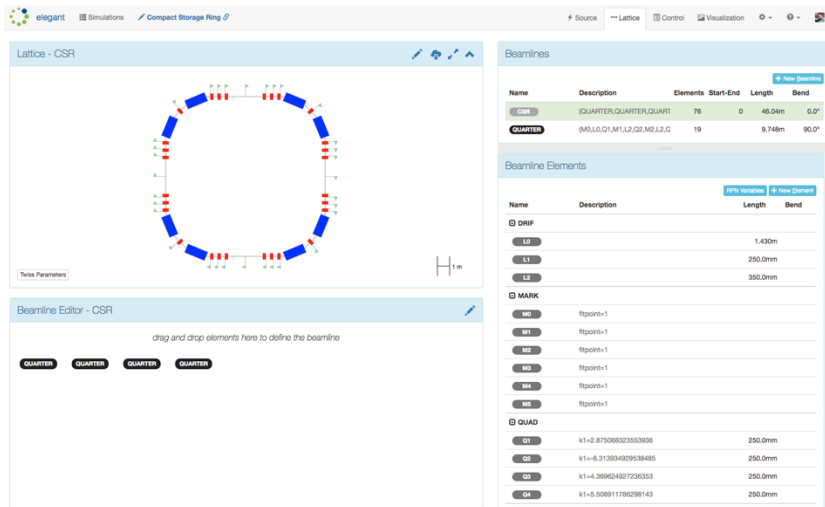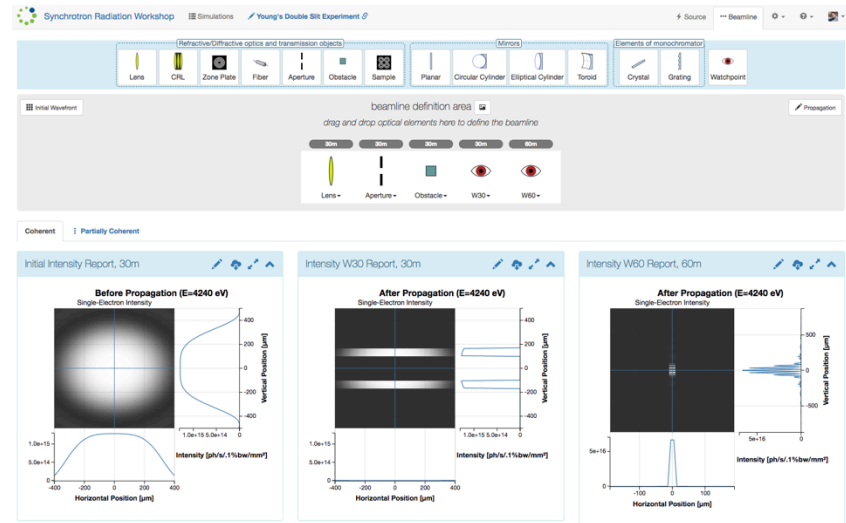
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Overview

- Goals
- Technology
- Demo
- Hello, World!

Goals

- Increase access to computational physics codes
  - *Zero-install for instant startup*
  - *Legacy file import for existing users*
- Ease sharing among scientists
  - *Platform to deliver models to our customers*
  - *Share links to simulations in publications*
- Reproducible research
  - *Full version and dependency management*
- Support legacy computational codes
  - *Most codes are decades old with well-known file formats*
  - *Authors are busy and prioritize research over coding*
- Seamless reversion to command line for experts
  - *Export to native format for HPC and local use*

Technology

- Javascript GUI
  - *AngularJS, D3.js, VTK.js, Bootstrap*
  - *Accessible on phone, desktop, and HPC (in situ)*
- Python Server
  - *Physicists use Python; Many codes python-wrapped*
  - *Flask, Numpy, OAuth, SQLAlchemy*
- Schema-driven Rendering
  - *Views and models are fully described*
- JSON Database
  - *Internal and external formats identical*
  - *Forward compatibility, forever!*
- Containerized Execution
  - *Docker: reliable builds, versioning, protected execution*
  - *Portability from laptop to cloud*

Demo

- Synchrotron Radiation Workshop (SRW)
- Model x-ray beam lines
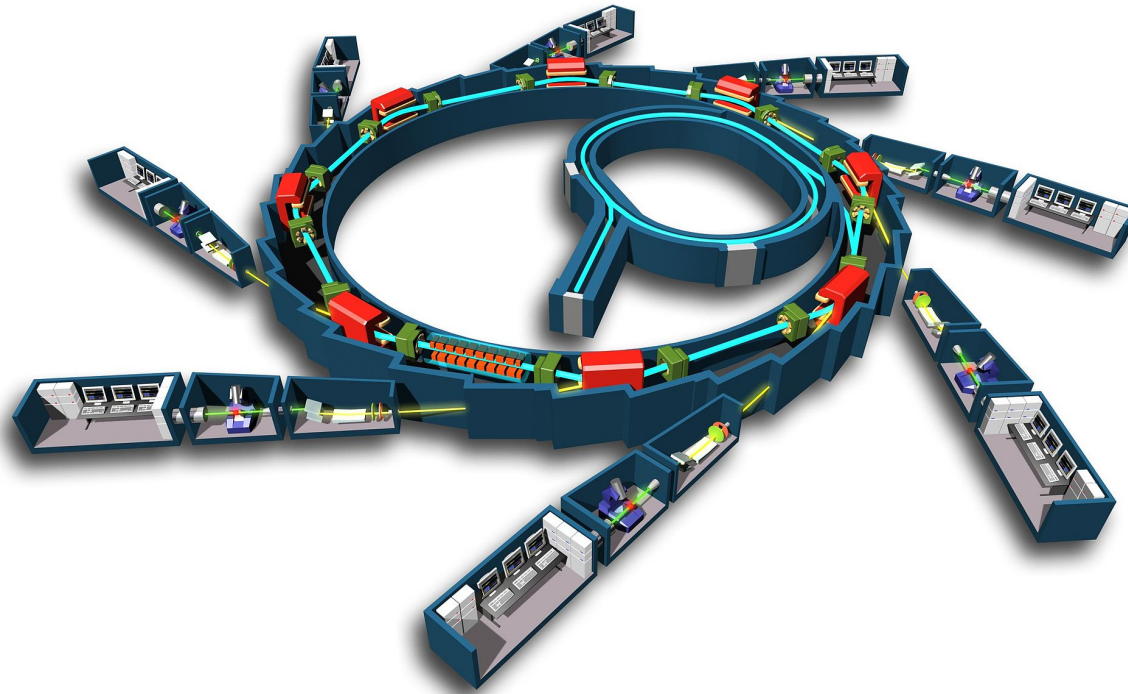
Conclusion

- Thank you
- Slides, poster, references: rsl.link/sgci18
- Questions?