



Princeton
Research Computing

Research Software Engineering Group

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CDH Campus Resource Roundtable – January 13, 2023



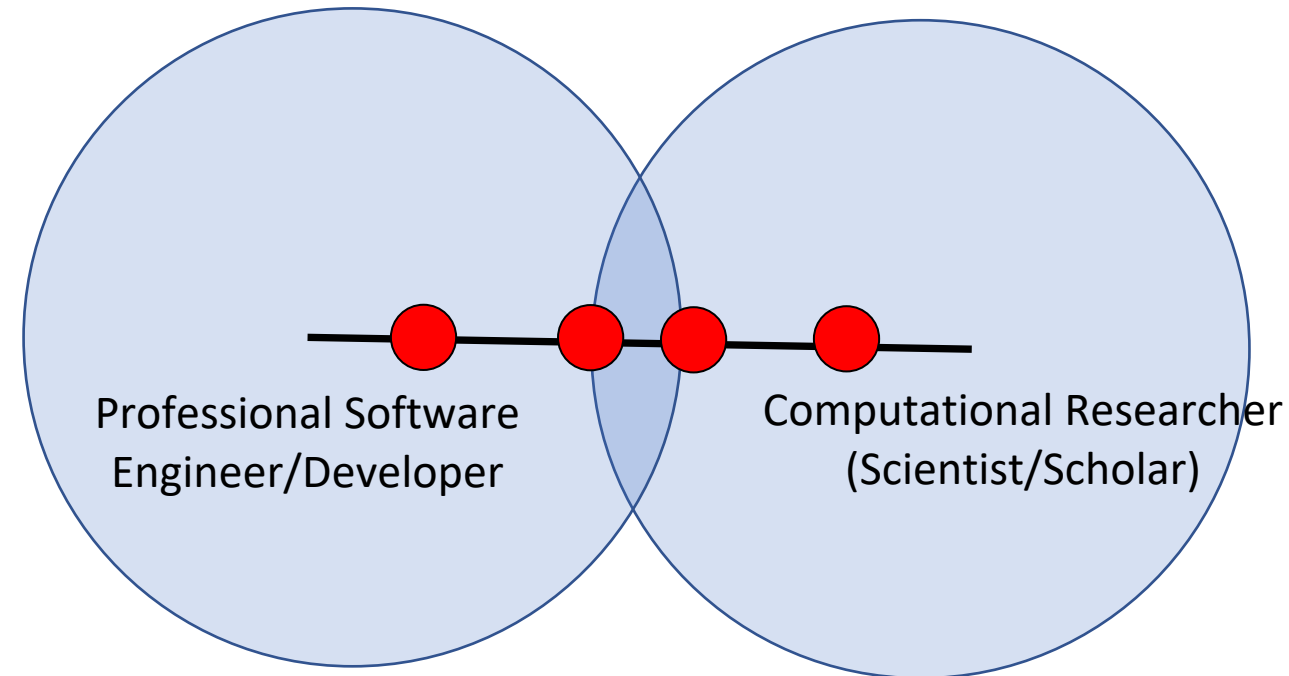
Princeton RSE Group

- Housed within Research Computing
- Goal: Help researchers create the most efficient, scalable, and sustainable research code possible in order to enable new scientific and scholarly advances.
- Complement traditional academic research groups with embedded, long-term:
 - Software development
 - Coding standards and techniques
 - Domain specific knowledge
 - Algorithm development and selection
 - Performance tuning & optimization



What is a Princeton RSE?

1. Software Engineer/Developer
 - Design, develop, refactor
 - Build tests, automation, documentation, etc.
2. Computational Researcher
 - Domain expertise
 - Implement algorithms in code
 - Use software to drive discovery



Sample RSE Projects

ASPIRE
Algorithms for Single Particle Reconstruction

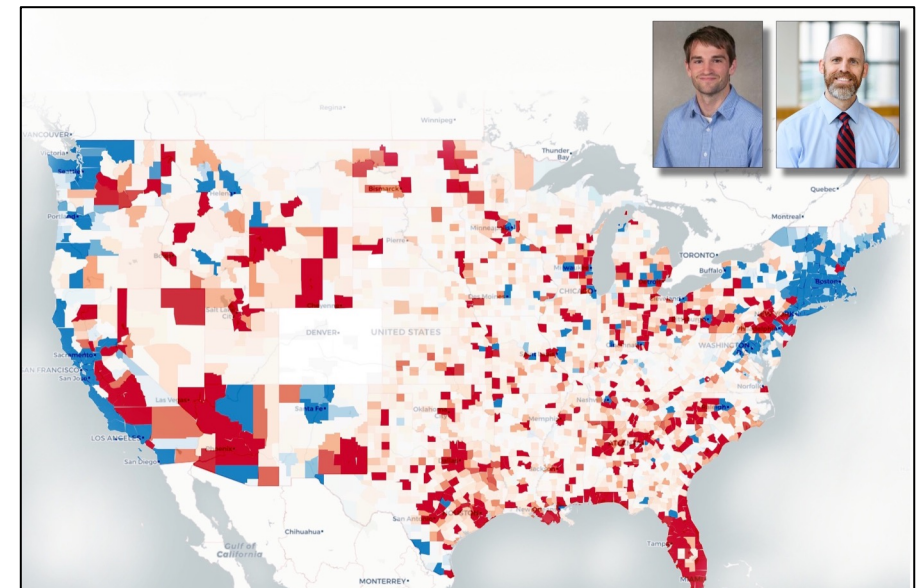
More Rigorous Mathematics on 2D Image Representation and 3D Orientation Estimation

Automatic Particle Picking More Advanced 2D Classification Distinct Structure Variability

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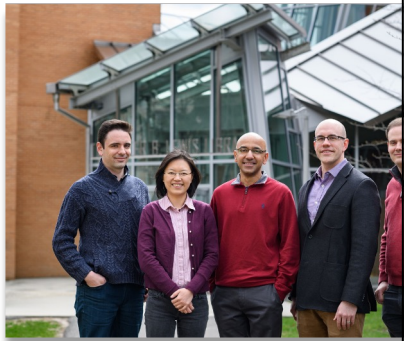
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RSE Group Growth

Princeton RSE Group, 2018



Princeton bets big on research software engineering

Eoin O'Carroll, Princeton Research Computing

Aug. 18, 2022



Over the past five years, Princeton's research software engineers (RSEs) have transformed a variety of research projects across campus, building software tools that [sequence proteins](#), [reconstruct events](#) in supercolliders, [model gene flows](#) between our extinct human relatives, and many more. Soon, they will lend their expertise to even more projects, as the RSE group **adds 10 new staff positions**. This expansion is part of a broader strategic initiative led by the offices of the Provost and the Dean for Research that aims to

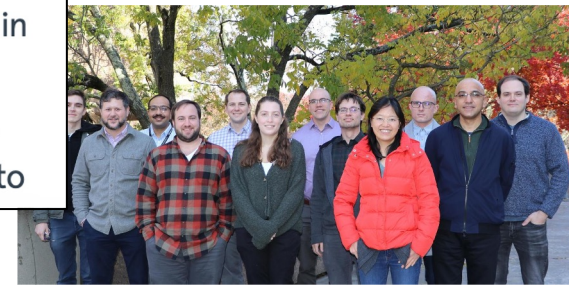


Princeton RSE Group, 2021

Princeton RSE Group, 2019



Princeton RSE Group, 2021



How We Work With Campus Partners?

- Occasional open calls for new partnerships that would benefit from an RSE
- Two-step application process:
 - A letter of intent, followed by
 - A 3-page proposal
- Open to all tenured and tenure-track faculty members from any division
- Reviewed by RSE Steering Committee
 - Primary: Research impact, RSE innovation, Deliverables
 - Secondary: Collaborative, Strategic, Sustainability
- Some arrangements have flexible project intake
 - CSML, DDSS, MOL, PNI
- Anticipate next call in November 2023 +/- 3 months

More Info: RSE Partnership Guidelines

- Introduction
- What is an RSE?
- RSE Group Mission
- RSE Partnerships & Funding
- RSE Expectations
- RSE Project Intake, Assignment, & Management
 - PI Project Proposal & Review
 - Single project partnership
 - Ad-hoc projects
- RSE Partner Expectations
- Publications & Authorship

The screenshot shows the Princeton Research Computing website. The header includes the Princeton Research Computing logo and navigation links for News, Events, Subscribe, Contact, and a search bar. The main navigation menu includes Get Started, Systems, Services (highlighted), Support, Learn, and Research. The breadcrumb trail is Home » Services » Research Software Engineering. The left sidebar contains a list of links: Supported Software, Research Software Engineering, Group Members, Featured Project, RSE projects, RSE Blog, RSE Partnership Guide (highlighted), Data Transfer & Networking, Visualization, GIS & Geospatial Analysis, and GitHub Repositories. The main content area features the title 'Princeton Research Software Engineer (RSE) Partnership Guide' with a sub-header 'August 2021 - v1.0.0' and a section titled 'Introduction'. The introduction text discusses the increasing complexity of software development in research and the role of the RSE.