

# Open-Source Resources for Research Efforts across Disciplines

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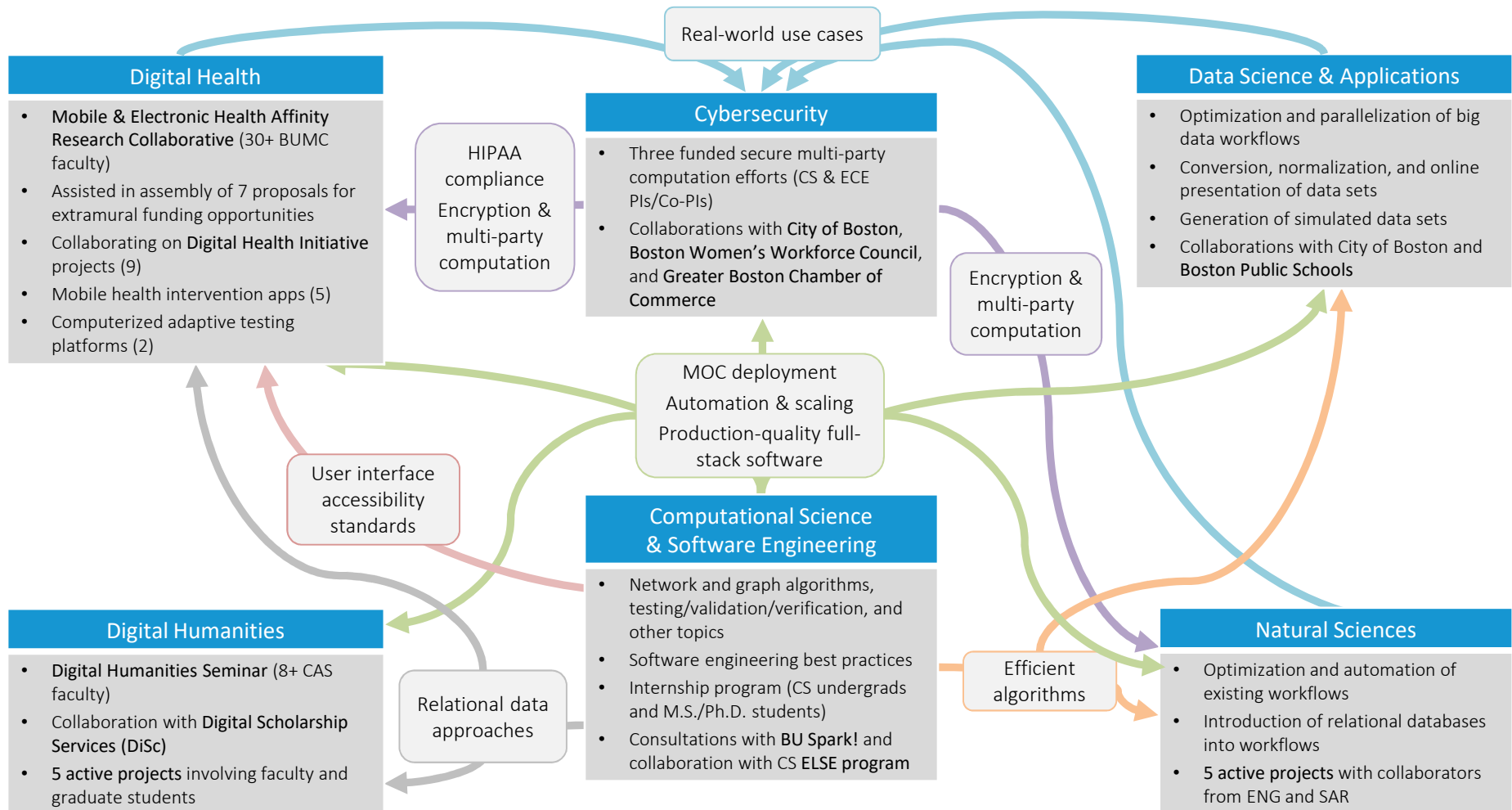
**Boston University** Rafik B. Hariri Institute for  
Computing and Computational Science & Engineering



# Software & Application Innovation Lab (SAIL): Purpose and Activities

purpose	Basic and Applied Research	Research Development	Efficiency and Engagement
advantages	<ul style="list-style-type: none"> <li>• Every member collaborates on original research and development</li> <li>• Like Ph.D. students/postdocs, but with additional professional skills               <ul style="list-style-type: none"> <li>• production-quality software engineering</li> <li>• project management, recruitment, consulting</li> <li>• design, usability, etc.</li> <li>• research development</li> <li>• certifications</li> </ul> </li> <li>• Reciprocal long-term investment/commitment</li> </ul>	<ul style="list-style-type: none"> <li>• Technical literacy and proficiency</li> <li>• Strategic advantage of readiness/stability</li> <li>• Interface and central point of contact between complementary entities               <ul style="list-style-type: none"> <li>• investigators and research groups</li> <li>• CS, ECE, etc.</li> <li>• RCS/SCC, MOC, IS&amp;T, InfoSec, Office of General Counsel</li> <li>• student community</li> </ul> </li> <li>• Facilitation of otherwise infeasible research efforts</li> </ul>	<ul style="list-style-type: none"> <li>• Reuse of data sets, software artifacts, and skills               <ul style="list-style-type: none"> <li>• across projects</li> <li>• retention within BU over long term</li> </ul> </li> <li>• Reductions of sunk costs               <ul style="list-style-type: none"> <li>• recovery of projects dormant due to absent resources/capacity</li> <li>• identification and vetting of external vendors</li> </ul> </li> <li>• Improvement of technical literacy throughout the community</li> </ul>
activities	<ul style="list-style-type: none"> <li>• Research and implementation               <ul style="list-style-type: none"> <li>• self-initiated or collaborative funded research efforts</li> <li>• collaborations on Hariri Research Award projects</li> </ul> </li> <li>• Authoring publications and presenting at conferences</li> </ul>	<ul style="list-style-type: none"> <li>• Assembly of technical content/letters of support</li> <li>• Assembly of research proposals</li> <li>• Leveraging CS undergrad/MS/Ph.D. students via internship and fellowship programs</li> </ul>	<ul style="list-style-type: none"> <li>• Open source development and documentation</li> <li>• Skill and expertise development (e.g., HIPAA, accessible UIs)</li> <li>• Workshops, initiatives, and collaboratives</li> </ul>

# Identifying and Leveraging Synergies across Projects and Disciplines in the Academic Ecosystem



# Example: Customizable Open Source Web Service Backend

## Synthetic biology database and cloud-based service for managing lab bioreactors

- Standard API documentation
- Registration and authentication features
- Deployment directly onto servers or via Docker

## Patient assessment platforms and behavioral intervention mobile app backends

- HIPAA compliance
- User roles/groups (patient, clinician, administrator) and access controls
- Support for encryption and secure multi-party computation

## Tools and platforms for enabling research collaboration in medicine

- Interactive schema design and sharing
- Schema/semantic negotiation and data harmonization

Clotho Home Apps Team Functions API Docs Login Register

Please go to /docs for all available routes with payloads.

Filter... X

**Authentication**

Available

- Forgot Password
- Login
- Logout
- Reset Password
- Signup

**BioDesign**

- Create BioDesign
- Delete BioDesign By Id
- Get BioDesign By Id
- Update BioDesign

**Blast**

- Blast
- Get Fasta File

**Clotho**

- Repository
- Version

**Clotho** 4.0.0

Store, Exchange, and Interact with Synthetic Biological Data

**Authentication**

**Authentication - Available** 4.0.0

Check if username and email is available

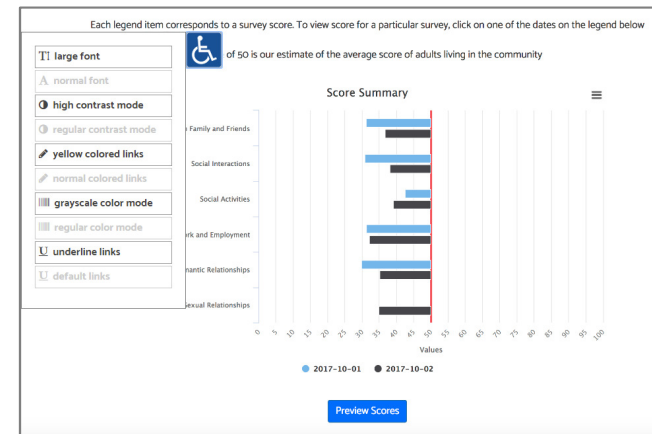
**POST**

`/api/v1/available`

Permission: none

**Parameter**

Field	Type	Description
username	String	user's username or email address.
password	String	user's password.



# Contacts, Inquiries, and Location

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Software Engineer

Greg Frasco  
Software Engineer

Lucy Qin  
Software Engineer

San Tran  
Manager, Research  
Dev. & Consulting

- Hariri Research Awards and Digital Health Initiative Awards: technical questions, selection criteria as they apply to possible proposal topics, feasibility of collaborating with SAIL
- Collaborating with SAIL on proposals for external funding (NSF, NIH, and others)
- Other general research and technical consultations
- Applicants for full-time and intern software engineer and UI/UX positions  
**(currently seeking full-stack and cybersecurity software engineers)**



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