The Statistics Online Computational Resource (SOCR) designs, validates and freely disseminates knowledge. SOCR invents, implements, confirms, and shares cutting-edge tools and end-to-end computational protocols for study designs, mathematical modeling, probability inference, statistical computing, and artificial intelligence. Working with collaborators, these resources are applied in a wide range of applications from health discoveries to STEM education, technology-enhanced instruction, and predictive big data analytics.

### Challenges

<table>
<thead>
<tr>
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<th>AI, Biomedical Informatics &amp; Data Science Approaches (SOCR, MIDAS &amp; MBDH)</th>
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</thead>
<tbody>
<tr>
<td>Lack of access to existing, effective, modern, active-learning resources</td>
<td>Embrace Open and FAIR Data Science</td>
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<td>Credit, acknowledgement, and recognition</td>
<td>Give credit, entice independent enhancements</td>
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<td>Storage, computing, networking limitations</td>
<td>Challenging, but Google, MS, AMZ, NVIDIA, RStudio provide free educational support</td>
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<td>Collaboration</td>
<td>Engage with fellow academics (MBDH, professional Societies), offer open-enrollment short courses, MOOCs.</td>
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<tr>
<td>o Cross-institutional partnerships (limited resources – time, funding, HR), o Transdisciplinary interactions (non-trivial), o Application domain repurposing (requires team-science support)</td>
<td>Collaborate with partners on R&amp;D projects</td>
</tr>
<tr>
<td>Licensing restrictions and obfuscated entries (use permissive CC-BY, LGPL, MIT, BSD)</td>
<td>LGPL for software and code, CC-BY for content</td>
</tr>
</tbody>
</table>

### Core Principles

- “It’s Online and Openly Accessible, Therefore, it Exists!” (SOCR motto, since its founding in 2002)
- FAIR (Findable, Accessible, Interoperable, and Reusable) resources, e.g., data, tools, code, apps
- Supporting the common-good, equitable, fair, transparent, trustworthy, rigorous, transdisciplinary, and sustainable education

### SOCR Resources

- SOCR Modeling, Computing, Biostats, ML/AI, Statistical Inference, and Translational Science Consulting
- SOCR Pubs and ongoing R&D Projects: [https://www.socr.umich.edu/html/SOCR_Research.html](https://www.socr.umich.edu/html/SOCR_Research.html)
- SOCR Events: [https://wiki.socr.umich.edu/index.php/SOCR_News](https://wiki.socr.umich.edu/index.php/SOCR_News)
- Data: [https://wiki.socr.umich.edu/index.php/SOCR_Data](https://wiki.socr.umich.edu/index.php/SOCR_Data)
- Apps: [https://socr.umich.edu/HTML5/](https://socr.umich.edu/HTML5/)

### Demonstrations

- Resource navigators (graphical, key phrase search)
- Electronic books
- MOOCs
- Driving STEM-motivational challenges and open data resources
- Software tools, R-packages, DSPA active-learning resources, and webapps,
- Time Complexity, Inferential Uncertainty & Spacekime Analytics
- Collaborative Open-Science (GitHub, Ongoing Research Project, Consulting, Pubs)

### Contact

Questions, comments, collaborations, and suggestions are always welcome. SOCR is looking for grad students with significant STEM background aspiring to tackle theoretical and applied problems.