Statistics Online Computational Resource (www.SOCR.umich.edu)
DCMB Bioinformatics Graduate Program 1st Year Grad Students
Oct 24, 2023 (3813/3817 Med Sci II, UMich/MM)

Topic: *The Statistics Online Computational Resource (SOCR)*
Presenter: Ivo D. Dinov (SOCR Director)

The Statistics Online Computational Resource 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.

<u>Challenges</u>	AI, Biomedical Informatics & Data Science Approaches (SOCR, MIDAS & MBDH)
• Lack of access to existing, effective, modern, active-learning resources	Embrace Open and FAIR Data Science
• Credit, acknowledgement, and recognition	Give credit, entice independent enhancements
• Storage, computing, networking limitations	Challenging, but Google, MS, AMZ, NVIDIA, RStudio provide free educational support

• Collaboration
  o Cross-institutional partnerships (limited resources – time, funding, HR),
  o Transdisciplinary interactions (non-trivial),
  o Application domain repurposing (requires team-science support)
	Engage with fellow academics (MBDH, professional Societies), offer open-enrollment short courses, MOOCs.
	
	Collaborate with partners on R&D projects

• Licensing restrictions and obfuscated entries (use permissive CC-BY, LGPL, MIT, BSD)	LGPL for software and code, CC-BY for content

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
- SOCR Events: https://wiki.socr.umich.edu/index.php/SOCR_News
- Data: https://wiki.socr.umich.edu/index.php/SOCR_Data
- Apps: 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)

Interested in SOCR?
Talk to Fellow Students:
Yueyang Shen & Pranjal Srivastava

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.==