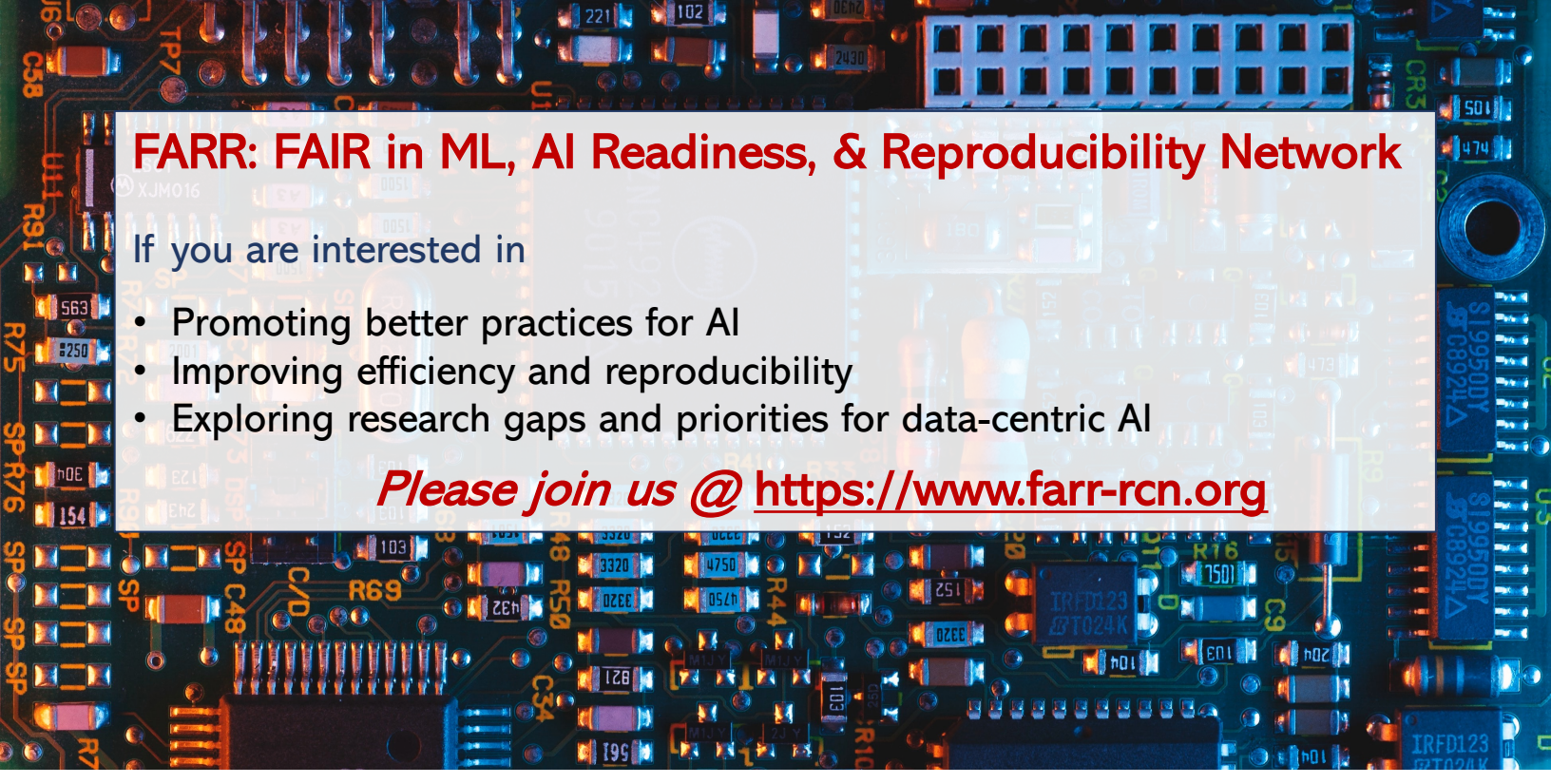

# FARR: FAIR in ML, AI Readiness, & Reproducibility Network

If you are interested in

- Promoting better practices for AI
- Improving efficiency and reproducibility
- Exploring research gaps and priorities for data-centric AI

*Please join us @* https://www.farr-rcn.org

SDSC
SAN DIEGO SUPERCOMPUTER CENTER

SCRIPPS INSTITUTION OF OCEANOGRAPHY
UC San Diego

NC STATE UNIVERSITY

ILLINOIS
NCSA | National Center for Supercomputing Applications

This work is supported through the National Science Foundation award # 2226453.

# AI Reproducibility Minute: Implementation Factors

Even if you use the same dataset and software, machine learning (ML) results can vary when run on different hardware and software versions. In order to ensure your ML results can be reproduced by others, consider documenting the following factors:

- **Initialization seeds** - note the *seeds* used
- **Parallel execution** - note the *number* of threads used
- **Processing unit** - note *which* processors were used
- **Software** - include the *exact version* of the operating system and the complete software stack used. Even better, include a link to the container.

**Other factors to consider:**

1) Compiler settings
2) Auto-selection of primitive ops
3) Floating-point operations
4) Rounding errors

For more, see *Gundersen, Odd Erik, Kevin Coakley, and Christine Kirkpatrick. "Sources of Irreproducibility in Machine Learning: A Review." arXiv preprint arXiv:2204.07610 (2022).*

*"…researcher and practitioner survey[s] show that 83.8% of participants are unaware of or unsure about any implementation-level variance."*

Pham, Hung Viet, et al. "Problems and opportunities in training deep learning software systems: An analysis of variance." Proceedings of the 35th IEEE/ACM international conference on automated software engineering. 2020.