Call for Papers

HiLD: High-dimensional Learning Dynamics Workshop @ ICML 2023 (July 28-29 TBD)

Website: https://sites.google.com/view/hidimlearning/home
Confirmed Speakers (in-person):

- **Sanjeev Arora** (Princeton, https://www.cs.princeton.edu/~arora/)
- **SueYeon Chung** (NYU & Flatiron Institute, https://sites.google.com/site/sueyeonchung/)
- **Murat Erdogdu** (Toronto, https://www.cs.toronto.edu/~erdogdu/)
- **Surya Ganguli** (Stanford, https://ganguli-gang.stanford.edu/surya.html)
- **Andrea Montanari** (Stanford, https://web.stanford.edu/~montanar/)

Learning dynamics of machine learning algorithms, especially under the assumptions of high-dimensional datasets, is enjoying tremendous growth as a field in ML. It provides theoretical guarantees and tools to explain lots of ML phenomena seen in practical applications. Tools from stochastic differential equations (SDEs), high-dimensional probability, and random matrix theory are regularly employed as techniques to model high-dimensional data and trajectories of optimization algorithms. We aim to foster discussion, discovery, and dissemination of state-of-the-art research in high-dimensional learning dynamics relevant to ML.

We invite participation in the 1st International Workshop on "**High-dimensional Learning Dynamics**", to be held as a part of the ICML 2023 conference. We invite high quality submissions for presentations as contributed talks or poster presentations during the workshop. We are especially interested in participants who can contribute theory / algorithms, models, or applications with a machine learning focus on dynamics of algorithms and random matrix theory/high-dimensionality as applied to ML and encourage work-in-progress and state-of-art ideas.

All accepted contributions will be listed on the workshop webpage and are expected to be presented as a poster during the workshop. A few submissions will in addition be selected for contributed talks as part of the main sessions.

The main topics are, including, but not limited to:

- Modeling of high-dimensional datasets
- Training and learning dynamics of algorithms
- Random matrix theory applications in ML
- Stochastic differential equations (SDEs) in ML
- Modeling of loss landscapes
- Universality concepts in ML
- Average-case analysis of optimization algorithms
- Dynamical mean field theory
- Neural tangent kernel modeling
- Gradient flow of neural networks
- Applications of high-dimensional statistics and random matrix theory in ML
- Simple analyzable models for deep neural networks

Notification Timeline

- Deadline for submission of papers: **May 29, 2023**, anywhere on earth (*)
- Notification of acceptance: June 9, 2023
- Camera-Ready Papers: July 21, 2023 (HiLD style file required, available at HiLD website.)
- Workshop date (TBD) (July 28, 2023 or July 29, 2023)

(*) If you face severe difficulties meeting this deadline, please contact us before the deadline.

Submission of papers will be through CMT and limited to no more than **5 pages** plus supplementary materials.