

Summer @ ICERM 2020

Fast Learning Algorithms for Numerical Computation and Data Analysis

Institute for Computational and Experimental Research in Mathematics

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Organizers



Yanlai Chen
University of
Massachusetts
Dartmouth



Akil Narayan
University of Utah



Minah Oh
James Madison
University

TA's



Justin Baker

University of Utah



Justin Dong

Brown University



Alexandru
Mihai

Okinawa Institute
of Science and
Technology



Liu Yang

Brown University

Summer @ ICERM

This is an REU-style summer program.

The program is virtual.

We hope to provide a healthy balance of

- stimulating mathematics
- exposure to career-building guidance
- virtual social events

Week 1: Intro and projects

This week should focus on:

- meet and greet
- project introductions and overview
- choosing projects
- virtual program logistics

Project descriptions

There are 6 projects associated with this program:

- Iterative methods for electromagnetics problems
- Randomized singular value decomposition and its applications
- Efficient eigensolvers and their applications
- Theoretical and computational aspects of expressive power of deep neural networks
- Graph spectral clustering and sparsification
- Random projections and dimension reduction

Friday @ Noon: you will submit a **ranked list of 3 projects**.

End of day Friday: organizers + TA's form 6 groups of 2-4 participants/group

Student presentations

Afternoons Tuesday - Thursday.

Tell us about yourself!

- 5-10-ish minutes, format up to you
- Professional biodata: institution, interests, major/concentration, plans after undergrad, etc
- Mathematical/computational interests in this program
- Best virtual online game you've played
- Any personal info you're comfortable sharing: favorite food, sports, hobbies, etc.

Weeks 2+

This is a virtual program.

But we still expect all 6 groups to interact or meet in some way daily!

Specific meeting format is flexible.

Mentors/guides for each group:

- 2 TA's
- 2 organizers

The mentors exist to help you: don't be shy to approach them!

Success of each group relies on interaction!

Goals and deliverables

What is expected in this program?

- Week 4/5: mid-program formal(-ish) presentations
- Week 8: end-of-program formal presentations
- (Optional) Technical report of investigation, progress, and future directions

What do I get out of this?

- mathematical + computational knowledge and experience
- experience in virtual collaborative tools and software
- opportunity to share group's work at conferences (e.g., poster @ JMM)
- possible journal publication

Virtual logistics

Suggested interaction tools:

- email
- Zoom
- Slack
- ...?

Suggested technical tools:

- \LaTeX (Overleaf)
- Matlab
- Python
- Version control (Github, ...)
- ...?

Organizer tips

Talk to people.

Talk to lots of people – fellow group members, participants, TA's, organizers, ICERM staff

Do not be afraid to ask questions – technical, career, social, etc.

Suggest ways we can improve anything program-wise

If something (anything) is not working, tell us, and/or TA's, and/or ICERM staff.

Ideas for virtual social events? Tell us!

Organize participant-only virtual social events (Netflix parties?)