Timeline

Part 1: Non-hands-on

- (1 min)   Introduction

- (~40 min)   Conceptual presentation of Topaz with real examples

- (~15 min)   Technical presentation of Topaz

- (5 min)   *Break!=)*

- (10 min)   Introduce:
  Topaz website
  Topaz GUI
  Topaz standalone tutorial
  Cryosparc tutorial
  Scipion integration
  Relion tutorial

- (10 min)   Quick Relion-Topaz tutorial *(just watch, don't follow along)*

- (10 min)   Quick Cryosparc-Topaz tutorial *(just watch, don't follow along)*

Part 2: Hands-on

- (20 - 30 min)   Cryosparc-Topaz tutorial with best-practices *(hands-on)*

- (30 - 60 min)   Participants work on their data and ask questions.

Topaz Cheat Sheet

Best practices and tips

- **Manually curate ~10-100 micrographs** (more=better), making sure particles are centered, all known views are represented, and micrographs are representative.

- You **don't** need to **label all particles**.

- Manually pick from denoised micrographs. Train and extract from raw micrographs.

- Denoise full micrographs (ie. before pre-processing).

- For **typical projects** (particle the size of apoferritin, 1 angstrom pixelsize): **Downsample by 8**. If particles are large, downsample by 16 for speedup. If particles are small, downsample by 4.

- The **most important training parameters** are usually: **number of particles per micrograph**, **training radius**, and **downsampling amount**.

- **Training radius** of **1, 2, or 3** usually works best regardless of the type/size particle.

- Make **extraction radius** the radius of the **longest axis of your particle** to avoid overlapping particles. Make extraction radius the **short axis of your particle** to pick densely packed irregularly shaped particles.

- **Particles are ranked** by a threshold value (larger = more likely a good particle). Use this as the **first step to filtering Topaz picks**.

Troubleshooting

- If your **Topaz takes a long time**, **CUDA/GPUs** probably **aren't configured** correctly so it is using CPUs.

- **If you pick junk or aggregation** to train on, **Topaz will learn how to pick junk and aggregation**.

Notes

- Ask questions any time! This is an informal workshop=)
- The hands-on portion is a great time to share your screen and get help on your specific project.
- Please mute your microphone if you're not speaking.
- For on-site users: Topaz is located here:
  /beegfs/sw/anaconda/anaconda3/envs/topaz/bin/topaz