KIASORT Instructions:

Overview

The GUI has six tabs; in this workshop, we will focus on **Main**, **Channels**, and **Curation**.

---

1. Main Tab

RUN Subtab

1. **Select Input Data File**

   o Click the "Input Data File" field and choose your data file (one single .bin or .dat file for all channels).

2. **Select Output Path**

   o Point this to any folder, typically, the same folder that contains your input data.

3. **Select Channel Map File**

   o Navigate to and select your channel map file.

Configurations

- Locate the "Configs" section and verify or adjust these settings:

   o **Num. Channels:** Set to number of channels in your dataset.

   o **Sampling Freq:** Ensure it is your data sampling frequency **(Hz)**.

o **Min Thr:** Typically, between **6–9**; you can select an appropriate value through **Channels Tab**.

o **Half Channel Extract:** Choose a value so that **2 × "Half Channel Extract" + 1** spans **150–300 μm** on your probe.

o All other parameters have sensible defaults. Feel free to adjust them if your data require different preprocessing or filtering.

Denoising

- Set **Denoising** Check Box **True** if the data requires denoising.

- Remove shared noise between channels, adjust as needed depending on your data.

  o **Noisy Ch Percentile:** % of channels showing the noise pattern.

  o **Noise Corr. Thr:** Correlation threshold to detect shared noise.

- **High Freq. Noise**: Check Box true if the data has extreme noise in the high frequency range. If set **True**, usually the **Denoising** check box does not need to be set **True**.

---

2. Channels Tab

1. **Plot Channels**

   o Click **Plot Channels**. The GUI will display all currently excluded channels.

2. **Edit Excluded Channels (Optional)**

   o In the plot, use each channel's checkbox to include or exclude it manually.

   o If you have made any changes, click **Save** to update the exclusion list.

3. **Set Threshold**

   o Use the slider to adjust the detection threshold until it matches the noise level in your data.

   o You can also:
     ▪ Modify how many channels are shown at once.

- Adjust the amplitude scale for visibility.
- Type a numeric value directly into the threshold box.

  o Note the threshold value, you will enter it in the Main tab before running the sorter.

---

3. Back to the Main Tab

1. **Run and Sort**

   o In the **RUN** subtab, click **Run and Sort**.

   o The software will:
      1. Extract samples.
      2. Run spike sorters on those samples and train classifiers.
      3. Apply the trained classifiers to the full dataset.
         o When sorting is finished, you will see a message saying:
      "Sorting complete."

---

4. **Curation Tab**

1. **Load and Plot Sorted Data**

   o Click **Plot Sorting** to load your recently sorted data.

2. **Choose Plot Type**

   o Under **Plot Type**, select **Multiple** to display multiple views simultaneously. Common choices include:

      - **CCG** (Cross-Correlogram)
      - **Waveform**
      - **ISI** (Inter-Spike Interval)
      - **Amplitude**

3. **Adjust Time Window**

   o In the lower-right corner, set the time window (e.g., the duration of a single trial) so you focus on the period you care about.

4. **Visualize Units/Groups**

- o Each cluster (or "group") has two checkboxes:

  - ▪ **Vis.**: Tick to display that group's plots.
  - ▪ **Select**: Tick to highlight a group and enable the **Spike Group Controller** options (e.g., merge, split, delete).

5. **Additional Curation Functions**

- o **Include/Exclude Channels**:

  - ▪ You can include or exclude channels based on firing rate, ISI, or SNR. ▪ Use the up/down arrows to step through channels one by one.

- o **Adjust Isolation or Remove a Group**:

  - ▪ Change a group's isolation estimate or delete the group entirely.
  - ▪ Use the "limit" button to select only the time periods when a unit was stably present.

- o **Similarity Processing for Merging**:

  - ▪ In the **Similarity Processing** panel, set a distance threshold to find candidate groups for merging.
  - ▪ Adjust similarity and amplitude-variation thresholds to filter which pairs are shown.
  - ▪ Use the up/down buttons to browse through pairs. When ready, merge the two—either into the last-selected group or by choosing a target group via the radio-button panel.

- o **Undo/Reset**:

  - ▪ If you make an undesired change, click **Undo** to revert the last operation for that group.
  - ▪ To reset everything back to its original state, click **Reset.**

---

5. Help Tab

- • For more information on any feature, click the **Help** tab. It provides full documentation on every tab, button, and parameter.