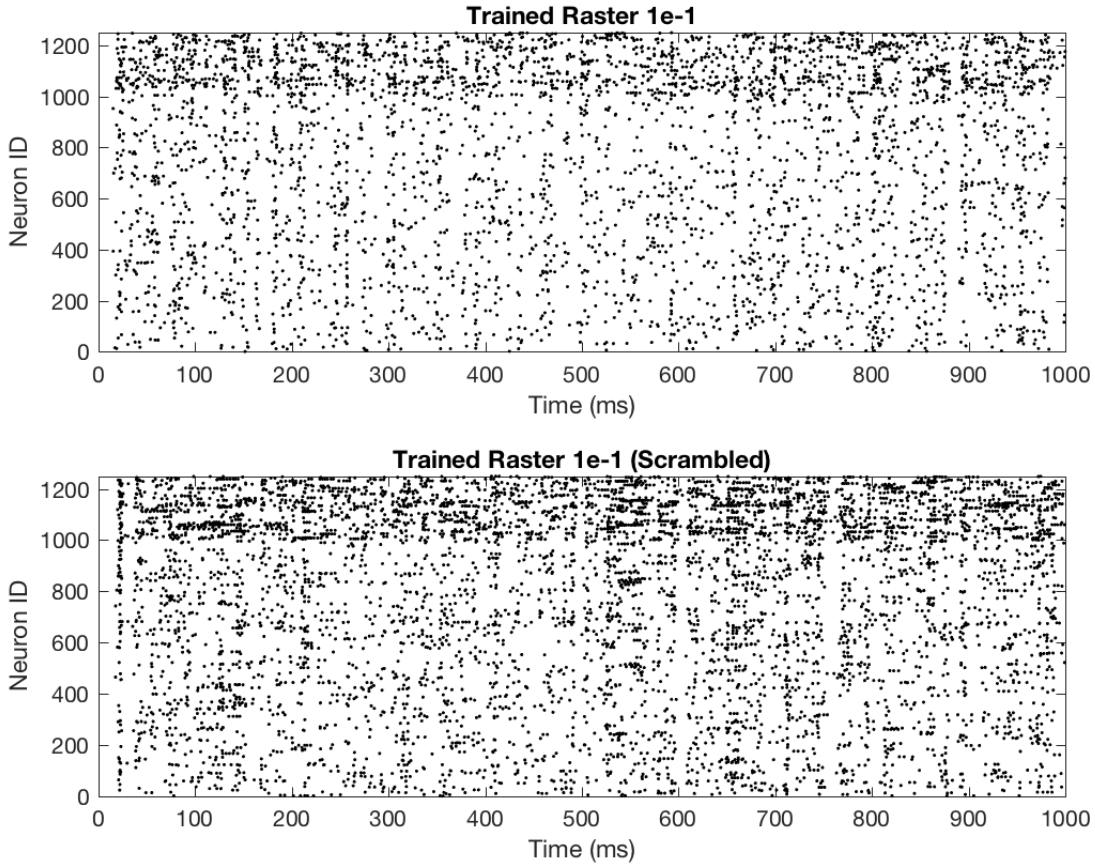
A



B

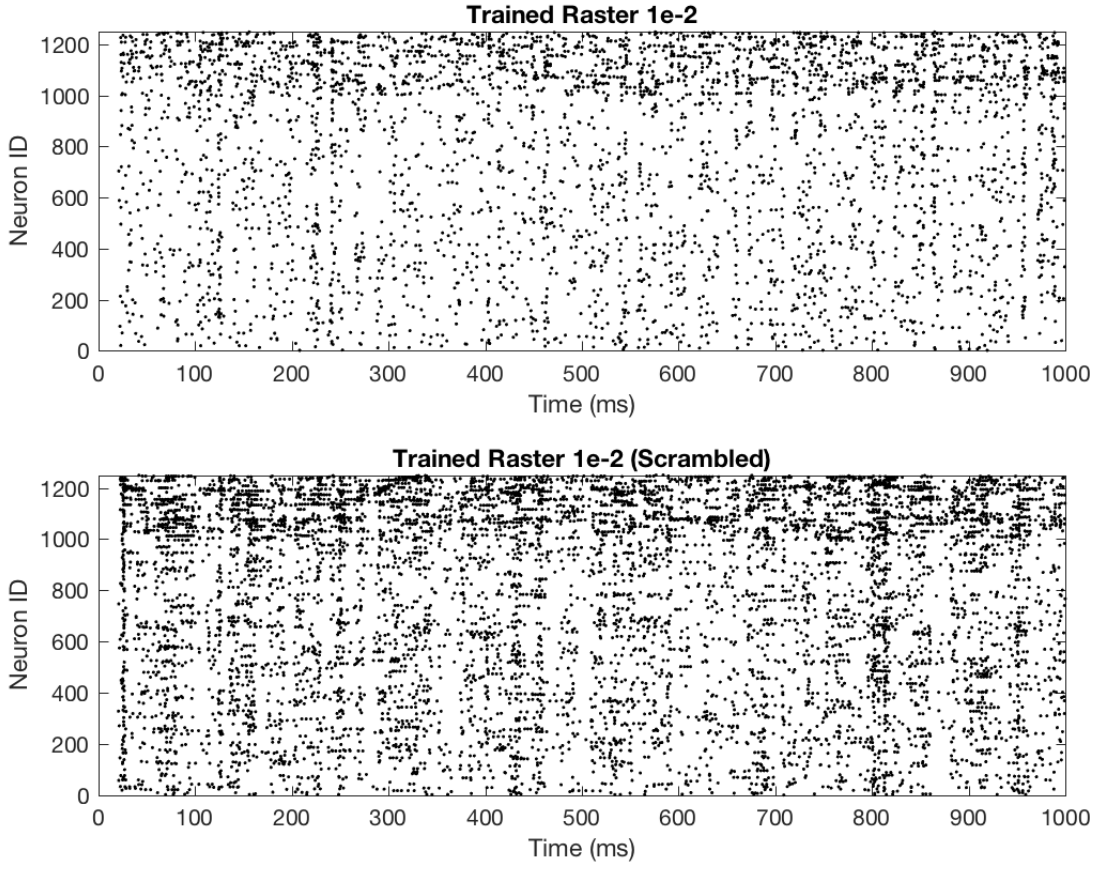
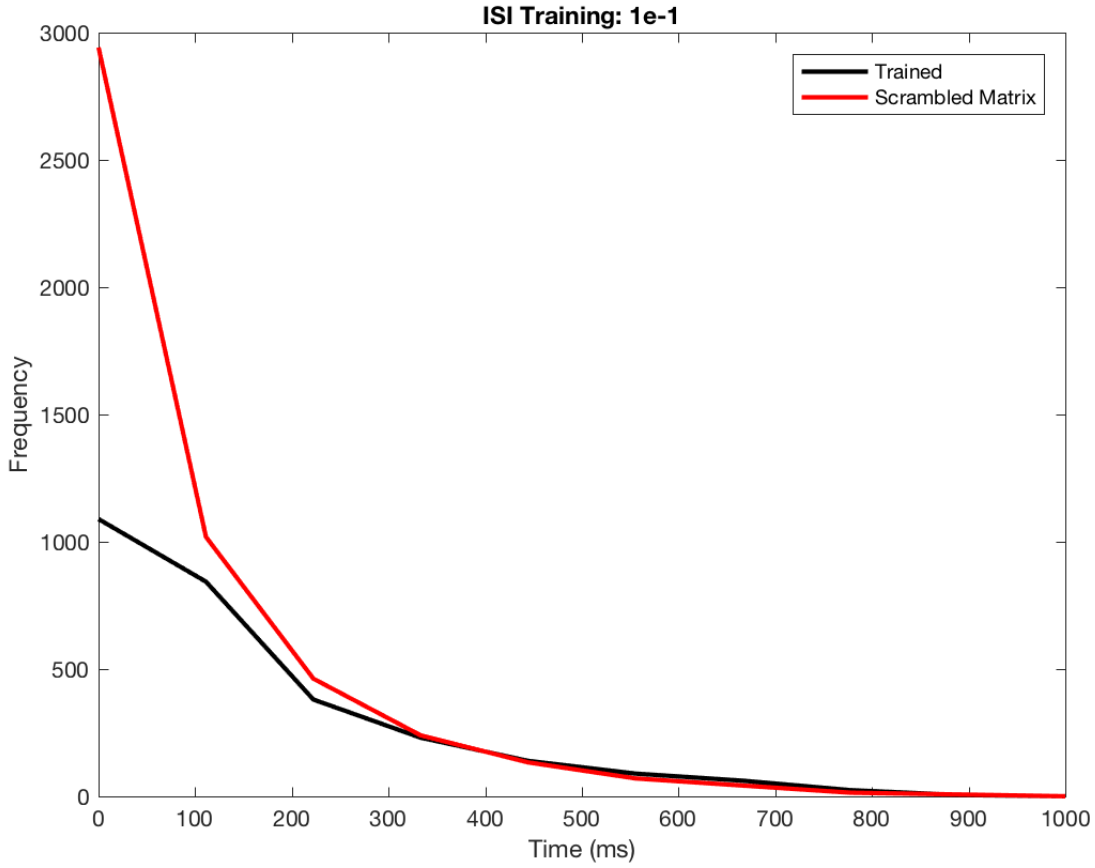


Figure A and **B**: **Figure A** is the the rasters of the simulation of a trained matrix at learning rate 1e-1, and **Figure B** is the the rasters of the simulation of a trained matrix at learning rate 1e-2. The top raster in **Figure A** is a trained matrix, but the raster below is a trained matrix with scrambled matrix values (a permutation matrix elements). Same goes for **Figure B**.

A



B

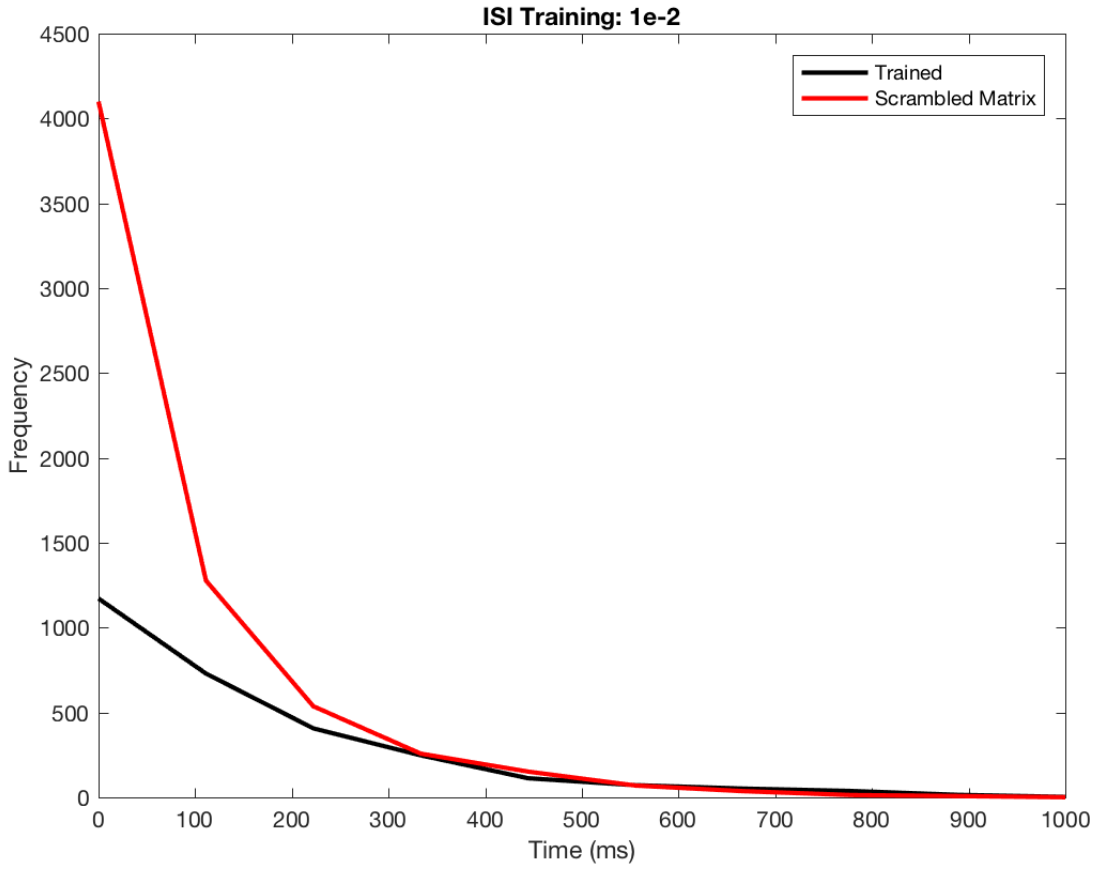
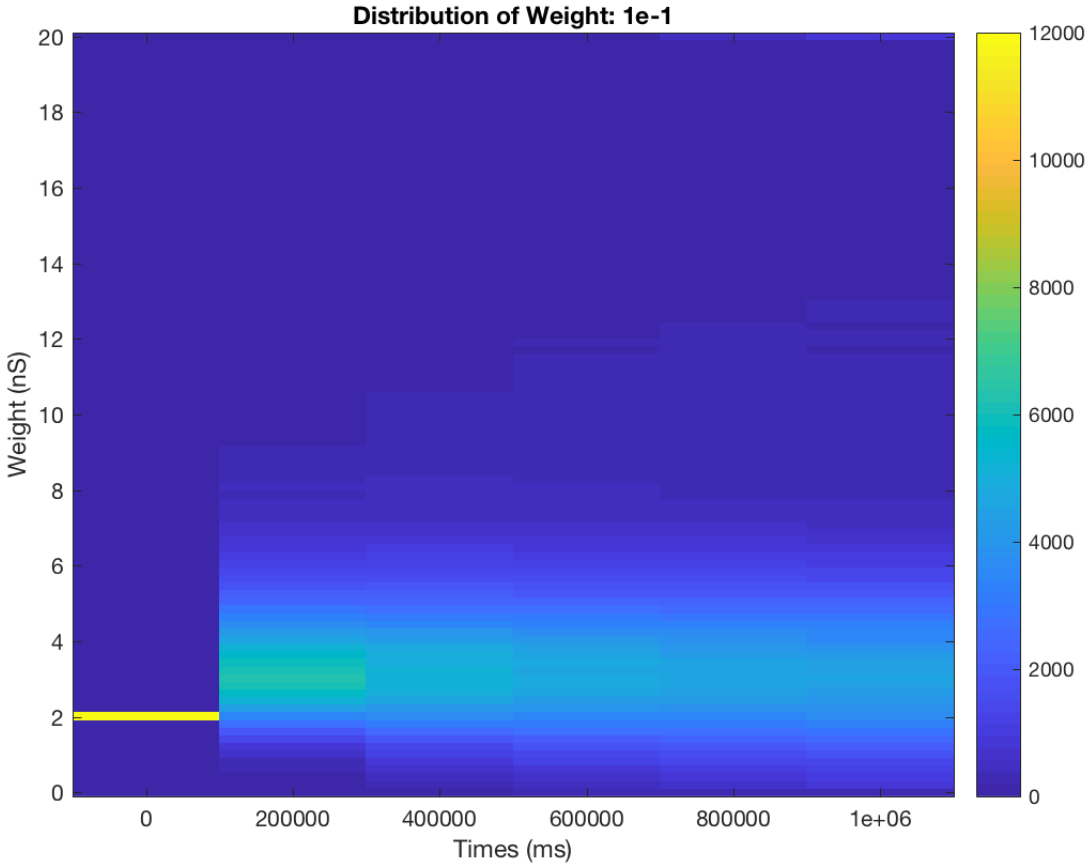


Figure A and **B**: **Figure A** and **B** are the ISI curves for the rasters of a trained and trained scrambled matrix. **Figure A** black curve is the ISI of the trained matrix, while the red curve is for a scrambled trained matrix. Same goes for **Figure B**.

A



B

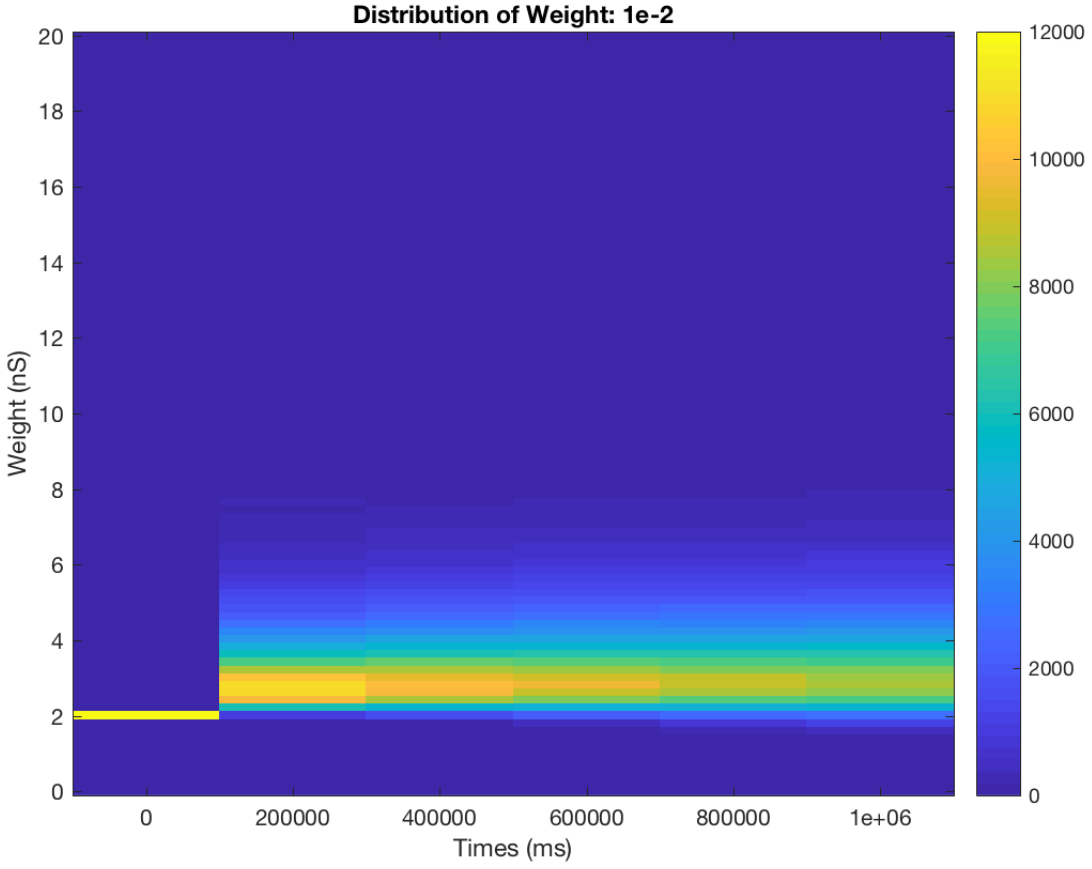
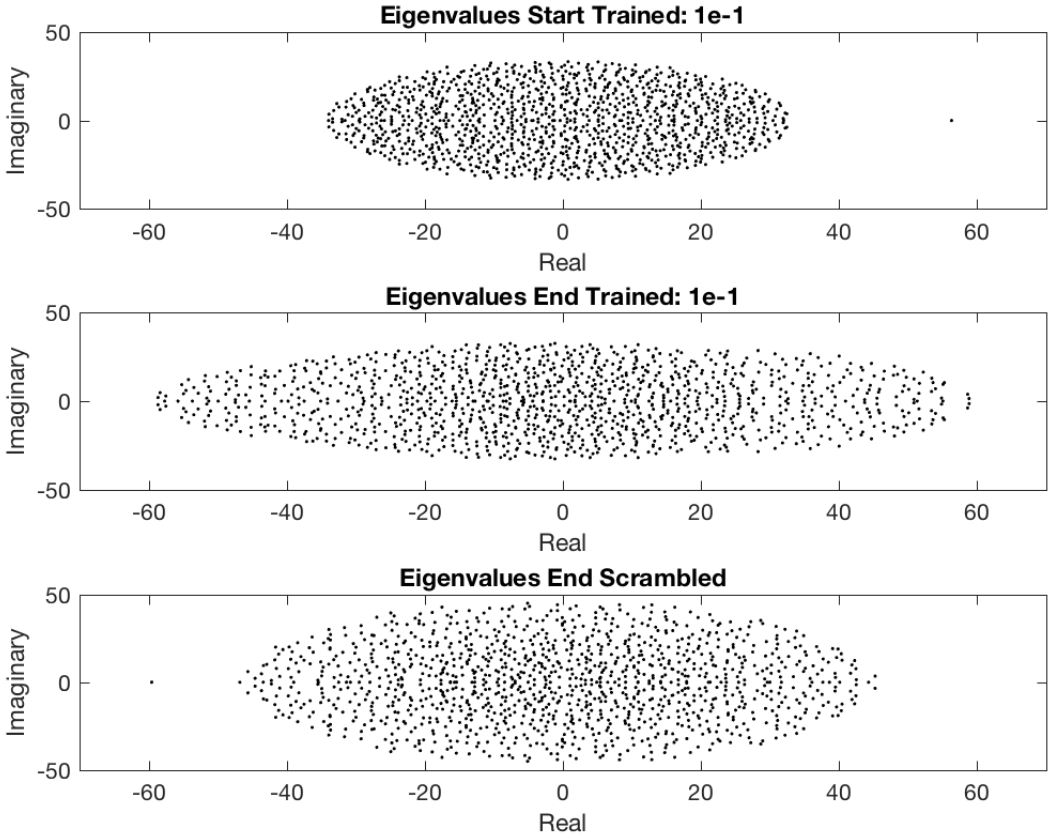


Figure A and **B**: **Figure A** and **B** are the distributions of the positive weights of the EI matrix over certain times.

A



B

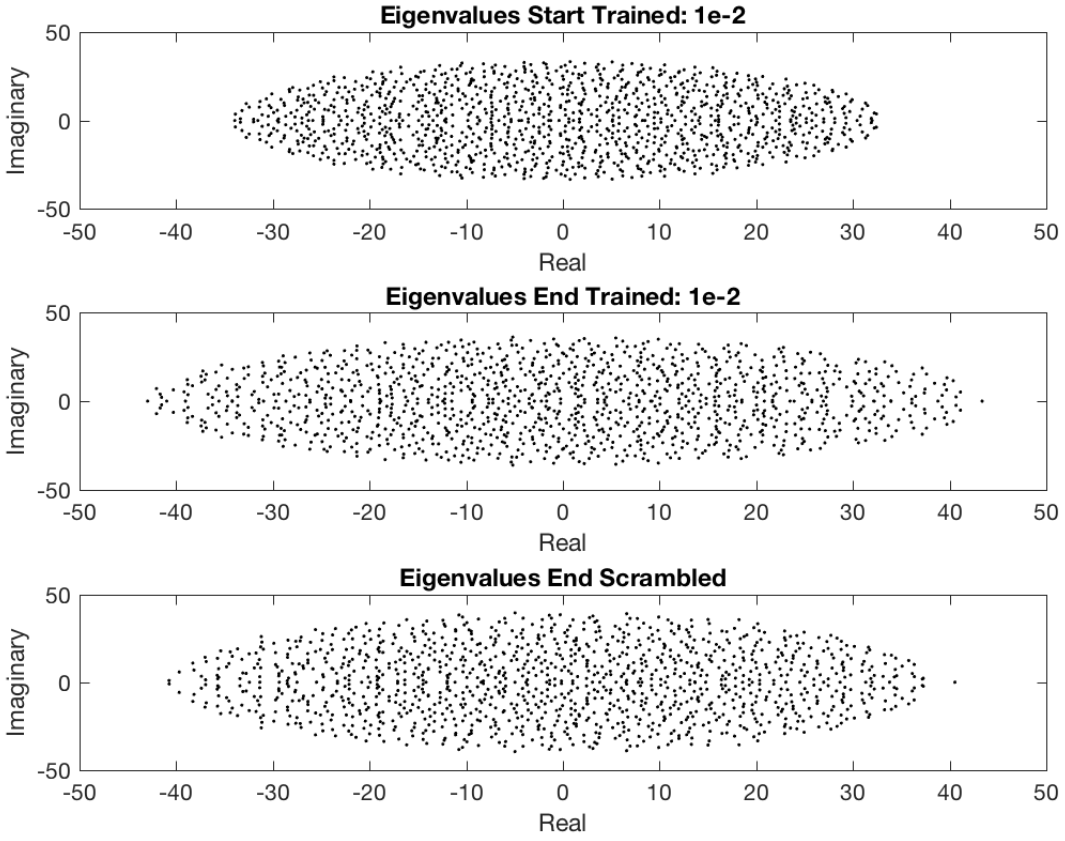


Figure A and **B**: **Figure A** and **B** are the eigenvalue spectrums of the untrained, trained, and trained scrambled matrix.