**Statement of work by PI Levin’s Lab**

PI Levin’s lab has a lot of prior expertise in building computational imaging systems, and they are the worldwide experts in wavefront shaping. PI Levin’s lab will be responsible for building the first system for wavefront shaping using single photon excitation and testing it on ex-vivo brain slices, evaluating its SNR and penetration depth. This system will use their existing wavefront shaping prototype, adapting it to the requirements of the current project.

The vivo experiments of the project will be performed in the Adesnik lab in Berkeley. Therefore, after testing the first prototype, the Technion team will either transfer their system to Berkeley or advise the Berkeley team on how to build a similar system. They will complete the first prototype by the end of year one. After that they will work on accelerating the estimation algorithm by implementing optical gradient descent acquisition and incorporating machine learning tools. They will also work on solutions that can extend the depth-of-field of the imaging system and allow measuring neurons over a large 3D volume.