Authentication is critical to cybersecurity, but existing solutions face many challenges. Passwords are either easy to crack, biometrics (e.g., fingerprints) are difficult to change, and two-factor authentication is cumbersome. We propose “passthoughts” [1,3], in which the user thinks his or her password. Our approach combines three factors of authentication (inherence, knowledge and possession) in a single step.

For comfort in everyday use, we collect multiple channels of EEG data using custom-fit earbuds [2] (above). Data from these earbuds reveals the alpha attenuation characteristic of EEG (right), indicating that we are indeed collecting signals from the brain. Following our past work [1], we treat authentication as a binary classification problem, where a given reading authenticates a user, or not.

We are currently assessing the FAR and FRR of our system for a population of n=6.

- Our past accuracy [3] without custom earbuds was 72%.
- We will also assess the usability of each task.

Following this feasibility study, we will perform a follow up in which people will use their passthought to authenticate in everyday life.

