Human-in-the-loop (HITL):

how Psychology can contribute to Machine Learning

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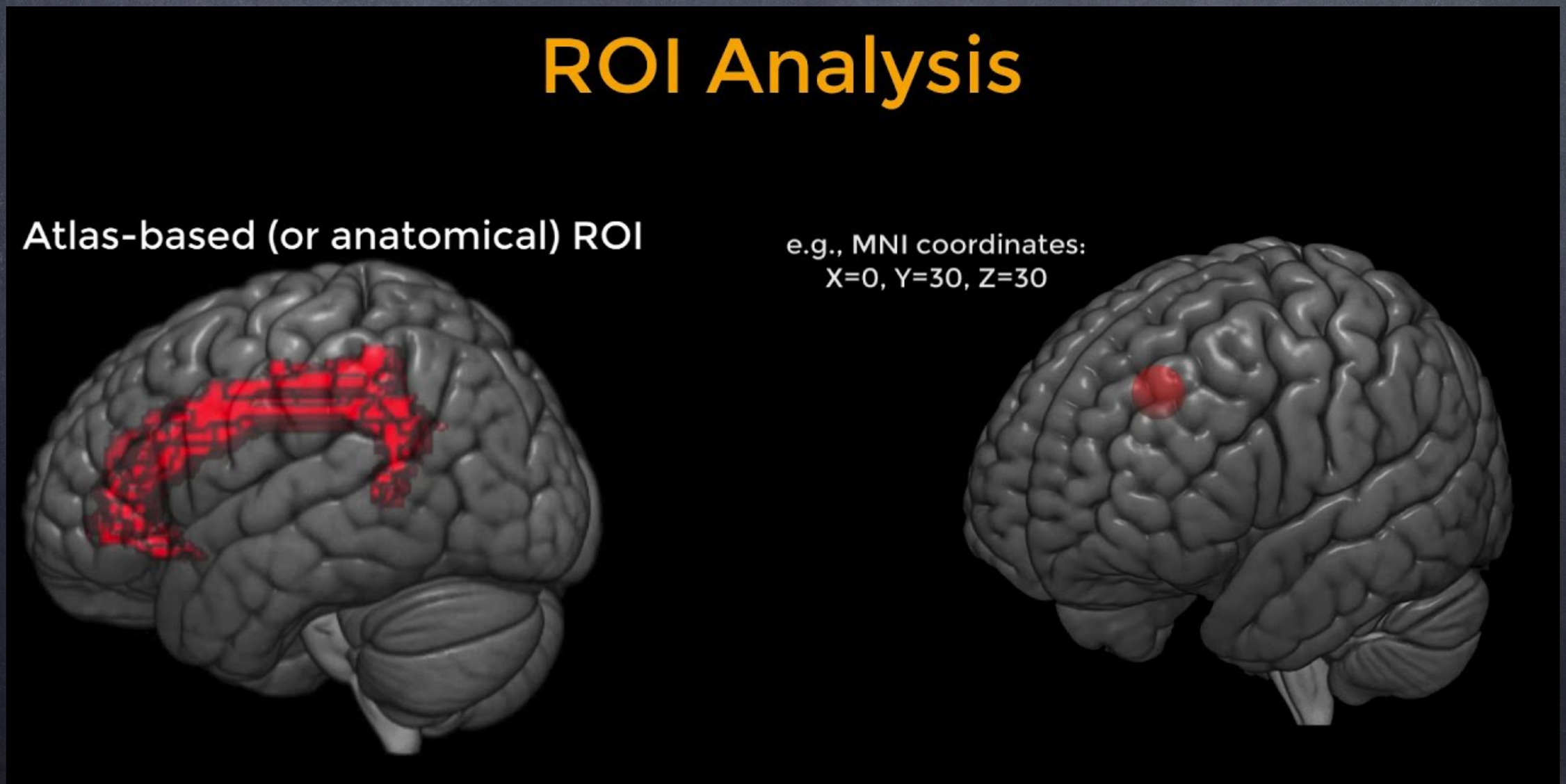
What's HITL?

- Human-in-the-Loop (HITL):
  - an approach to leverage both HUMAN and MACHINE INTELLIGENCE to create machine learning models
  - usually steps in by three actions

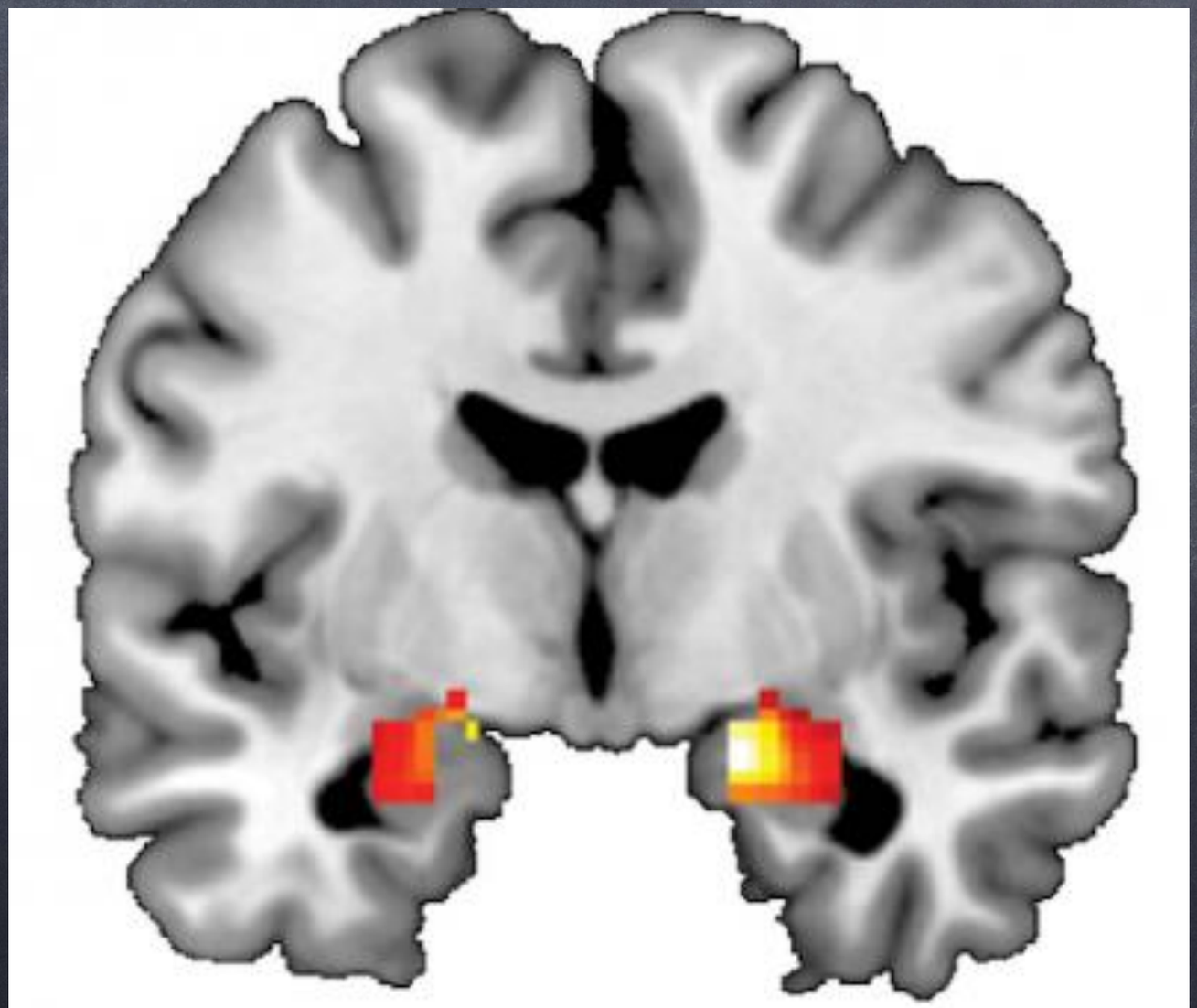
Humans label data

- The model can learn to make decisions upon the high-quality training data by humans



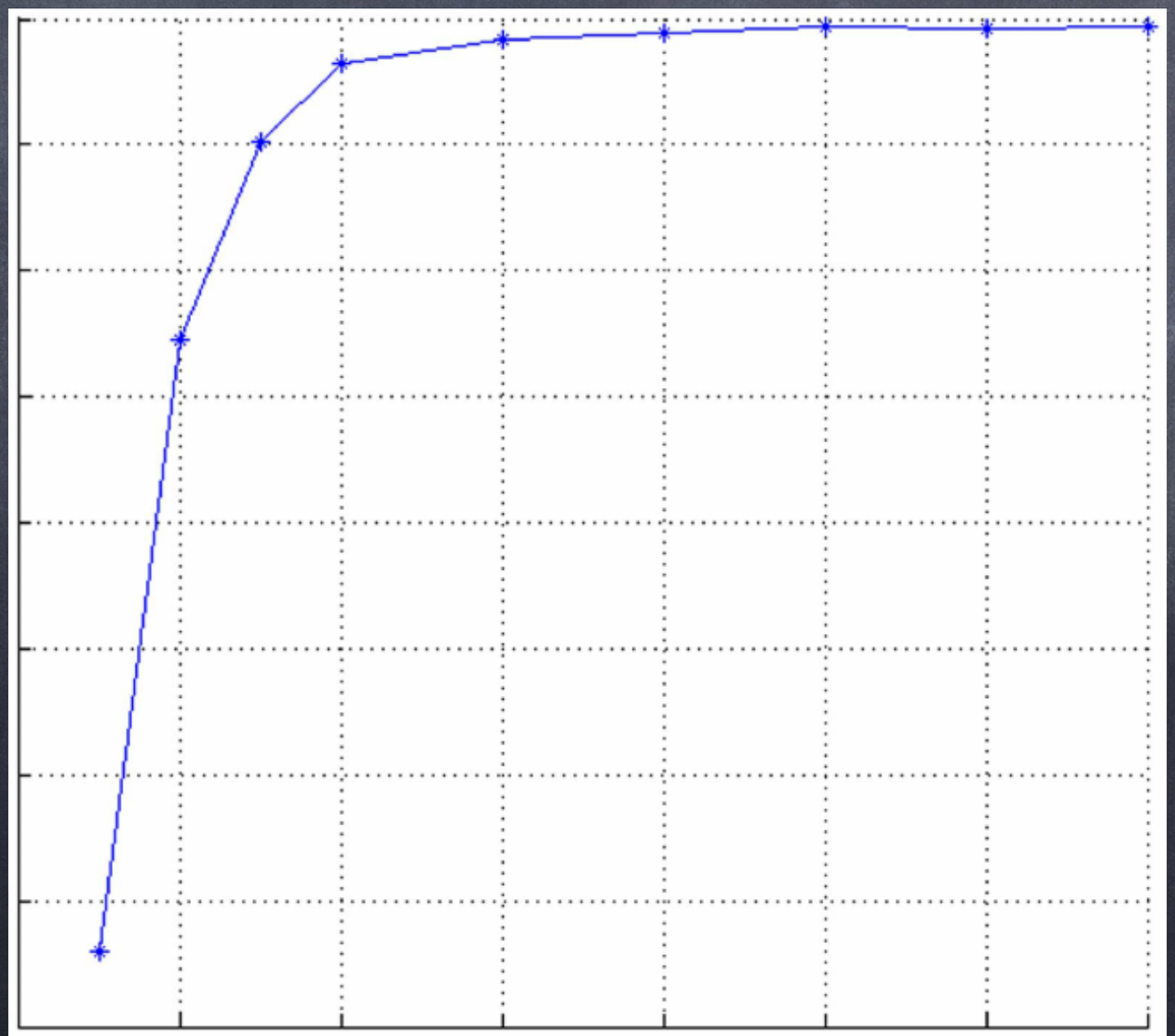
Humans tune the model

- Humans can correct the overfitting and teach the edge cases in the model or further to add on new categories



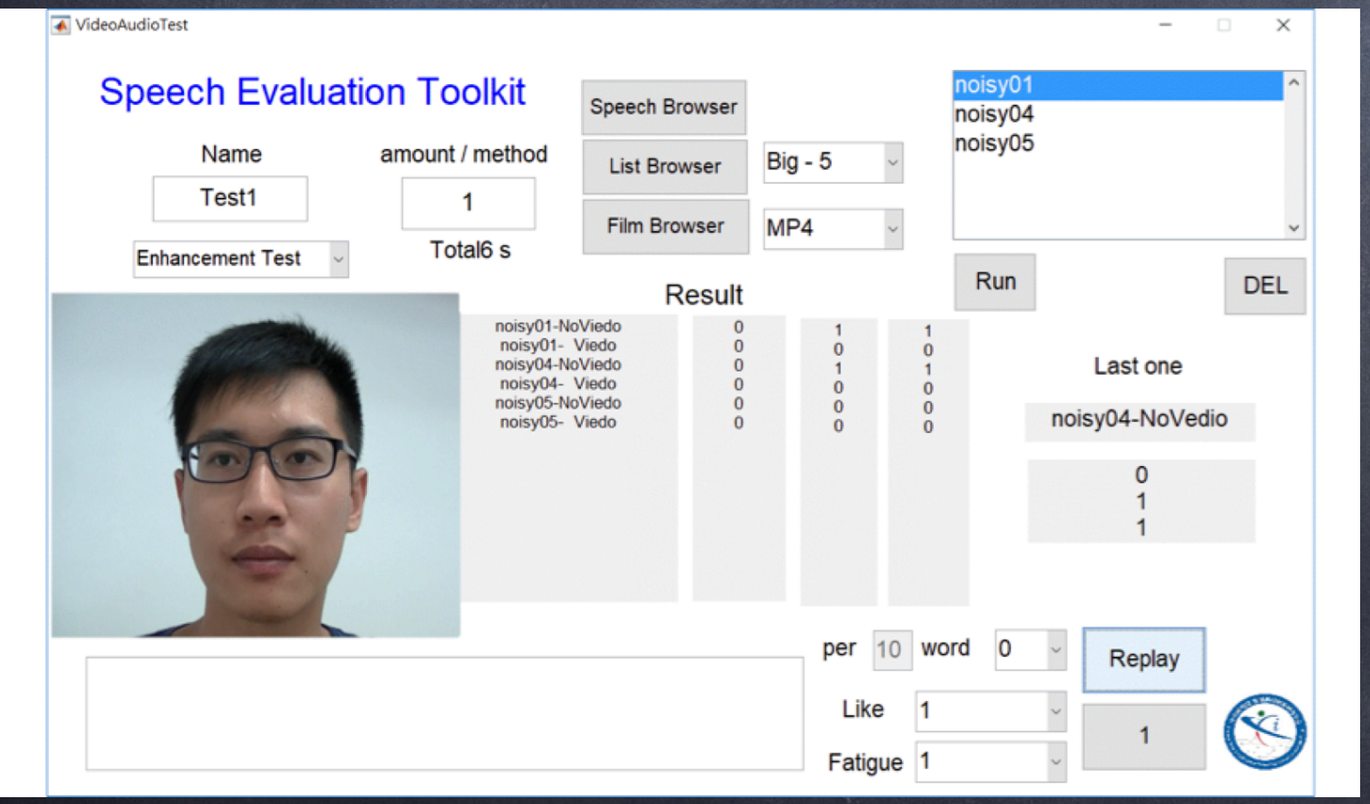
Humans test and validate a model

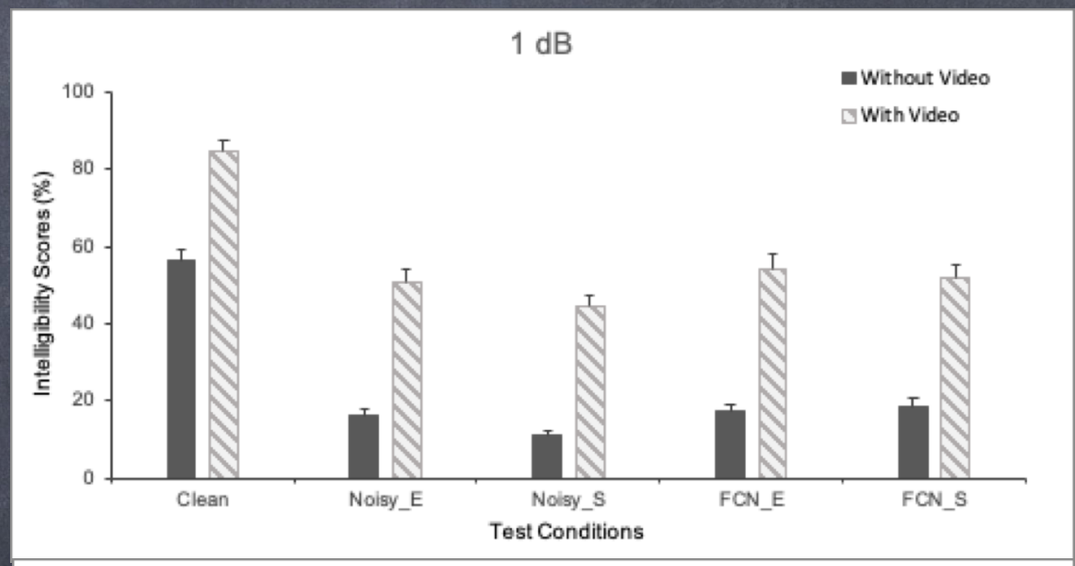
- By scoring outputs of a model, humans can spot the unconfident judgement or incorrect decision made by an algorithm

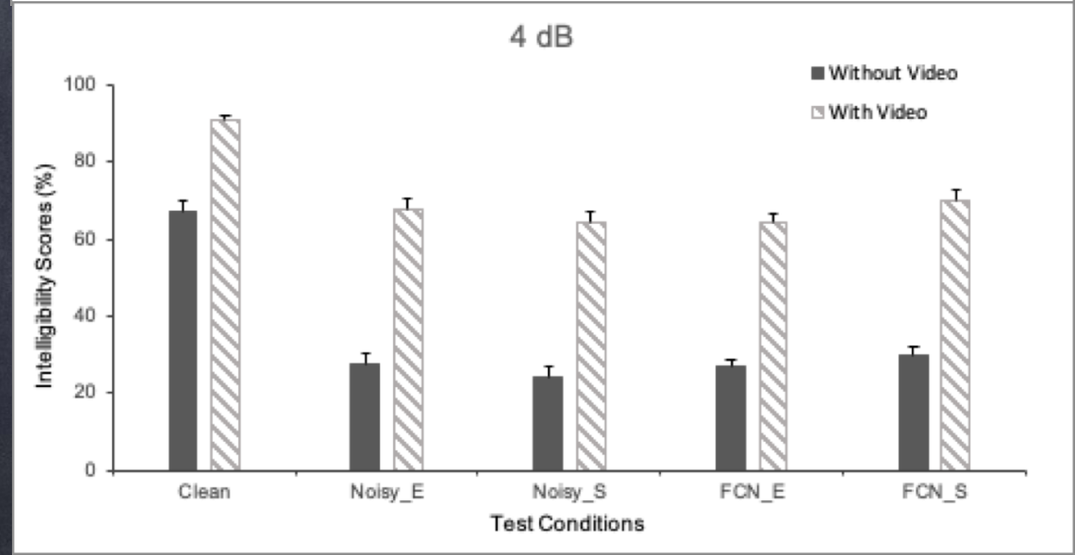


Testing & Validation

- Behavioral experiment: listening test to test the performance of denoising algorithm on normal-hearing group

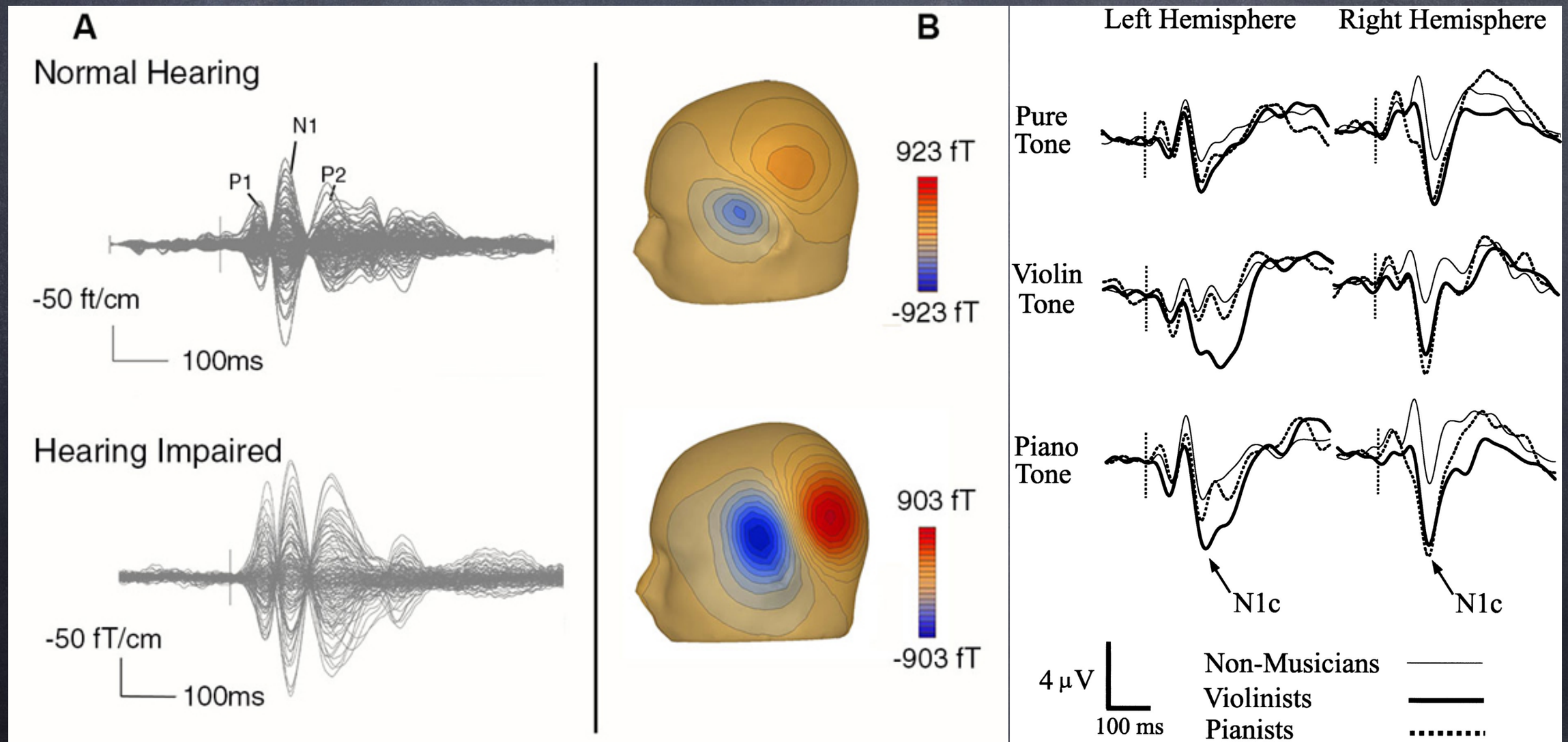






Testing & Validation (cont'd)

- Neuroscience approach: MEG (Magnetoencephalography) to validate the biological reaction for the denoising algorithm



Why HITL?

- SMARTER: HITL provides a continuous feedback in each of actions
- MORE ACCURATE: HITL serves as a better training and tuning regressor to learn between the next-known and unknown
- MORE EFFECTIVE: HITL helps model to select what it needs in the active learning

Thank you for your attention!