# mind-meld

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## 1 Artist Statement

### 1.1 Discussion of Themes

In psychological research, long-term couples have been shown to develop shared memory systems by pooling their cognitive resources [1,2]. This allows each partner to access more information with less cognitive effort, and is known by terms like "shared memory," "collective memory," "transactive memory systems," and "joint remembering" [3]. Couples can give each other personalized prompts to access memories [4], and their brain organization may even become more similar over time, as measured by functional magnetic imaging [5]. Interestingly, shared memory systems may also reduce the risk of age-related diseases like dementia [6].

This work explores the concept of replacing the human partner in a shared memory system with an AI. This idea, which likely elicits a negative connotation, could alternatively be viewed more positively, where the AI provides comfort and familiarity for those who have lost a loved one or struggle to connect with others.

The first component of the work, created with generative AI tools, explores one outcome of replacing the other human in a shared memory system with AI: over time, the AI system, represented as a UMAP of its embedding space (a dimensionality reduction and visualization method used for understanding relationships of an AI's embedding space, akin to the human brain), becomes more alien. The human brain, represented by a neuron, becomes more AI-like, taking on the characteristics of the organization of the embedding space of the AI.

The second component of the work, a series of acrylic paintings on canvas, explores another outcome, where the AI and human create a symbiotic relationship, one where the AI embedding space becomes organized in a more human way and the human is able to combat neuronal aging through the shared memory system with the AI.

Together, these two pieces represent the uncertain future of human-AI integration and how it may fundamentally change the way we think and remember. The juxtaposition of generative AI and human-created paintings reflects this tension between the promise and peril of developing relationships and collaborations with artificial intelligence.

### 1.2 Creation Process

This work represents a collaboration (or mind-meld) between human and generative AI.

Human: The original concept of exploring shared memory systems between humans and machines, the idea of representing the human as a neuron and the AI as a UMAP of its embedding space.

AI/Human Collaboration: Visualization brainstorming, determining the best ways to represent the information in a visual form. Stable Diffusion 3.

AI/Human Collaboration: Explored different visualizations of the UMAP and neuron. Photoshop Generative Fill.

38th Conference on Neural Information Processing Systems (NeurIPS 2024).

Human: Organized digital piece into a series.

AI: Generated background music. Sono AI music generation model.

After reviewing the digital piece, I was inspired to create a more human element using acrylic on canvas.

Human: Spray paint and acrylic on canvas.

## 2 Artist Biography

Brinnae Bent, PhD, is a faculty member in Artificial Intelligence at Duke University, a Responsible AI research scientist, a startup advisor, and an artist.

Brinnae is an accomplished researcher and ML practitioner, with over 30 publications and a breadth of experience developing algorithms across domains including health/wellness, sports, privacy, interior design, and energy. Her research on digital biomarkers is world-renowned and her emerging work on Responsible AI strives to solve important problems in the application of AI to real-world problems.

Brinnae has been creating award-winning art for over two decades. Brinnae's art spans the traditional (glass fusing, ceramics, and painting) and emerging (fusing AI, digital mediums, and traditional art). Previous AI-infused exhibits include 'don't break the mirror' currently under review (2024). 'Bridges: the abridged version' Art of a Scientist Exhibit (2021) and 'America the Beautiful: National Parks + Modern Art' (2020). See more of her work at runsdata.org.

## References

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