

The background features a light beige base with organic, flowing shapes in muted teal at the top right and earthy brown at the bottom left. White contour lines, reminiscent of topographic maps, are overlaid on these colored areas.

# **The Problem**





Team 3

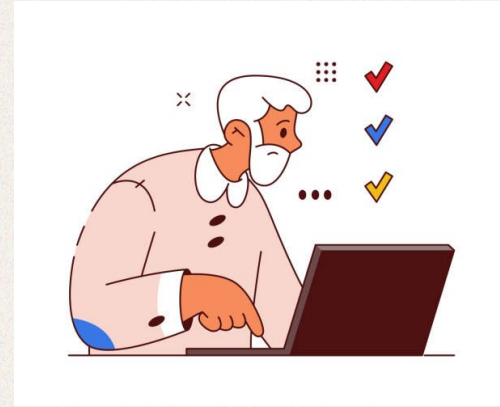


# What does Mnemos do?

- Train patients to actively recall recent events in their life
- Record a person's day to day life (audio + video)\*



<https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcTAIpkZpzD6ZFVHje1DTNoVM0OoNQYwneibw&s>



<https://www.istockphoto.com/illustrations/senior-man-computer?page=3>



# What kind of memory loss?

- Long-Term Memory Loss
  - Concussions
  - Trauma-Induced
  - Aging
  - Neurodegenerative diseases



[3] NIH National Institute on Aging. "Memory Problems, Forgetfulness, and Aging", NIH. Accessed: Feb 22, 2025. [Online]. Available: <https://www.nia.nih.gov/health/memory-loss-and-forgetfulness/memory-problems-forgetfulness-and-aging>

[4] E. Hersh. "Long-Term Memory Loss: What You Need To Know", healthline. Accessed: Feb 22, 2025. [Online]. Available: <https://www.healthline.com/health/neurological-health/long-term-memory-loss>

<https://www.dreamstime.com/photos-images/very-old-people.html>



# How does long term memory loss work?

## Symptoms:

- Trouble recalling information (events, facts, personal experiences) when you need it

## Potential Causes:

- Synaptic plasticity decrease and lack of memory maintenance
- Abrupt cranial trauma (think concussions)
- Tumours
- Major brain surgery

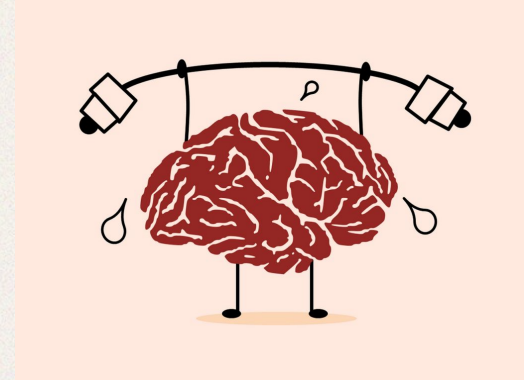
[5] J. V. Campellone. "Memory Loss", PennMedicine. Accessed: Feb 22, 2025. [Online]. Available: <https://www.pennmedicine.org/for-patients-and-visitors/patient-information/conditions-treated-a-to-z/memory-loss>

[6] "Memory Loss", Cleveland Clinic. Accessed: Feb 22, 2025. [Online]. Available: <https://my.clevelandclinic.org/health/symptoms/11826-memory-loss>



# Current Treatments (Very Complicated)

- Medications
  - Donepezil, Rivastigmine, Galantamine
- Diets: Sufficient vitamins
- Physical Activity
- Mental Stimulation: Crafts, puzzles, games
  - Spur the brain to continuously work



<https://qbi.uq.edu.au/article/2017/09/training-and-stimulation-improves-brain-performance>

[7] "Medications for Memory, Cognition and Dementia-Related Behaviors", ALZHEIMER'S ASSOCIATION. Accessed: Feb 22, 2025. [Online]. Available: <https://www.alz.org/alzheimers-dementia/treatments/medications-for-memory>

[8] "Memory Loss", Cleveland Clinic. Accessed: Feb 22, 2025. [Online]. Available: <https://my.clevelandclinic.org/health/symptoms/11826-memory-loss>



# How Active Recall Helps

1. Hippocampal Activation: Hippocampus is engaged during active recall.
2. Neuroplasticity and Memory Consolidation: By repeatedly retrieving information, neural pathways associated with the memory are reinforced

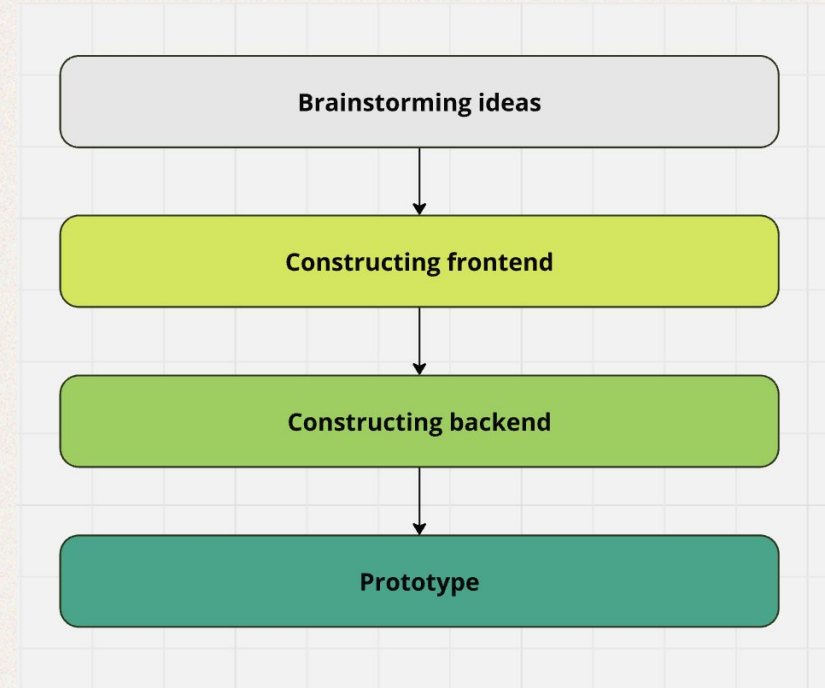
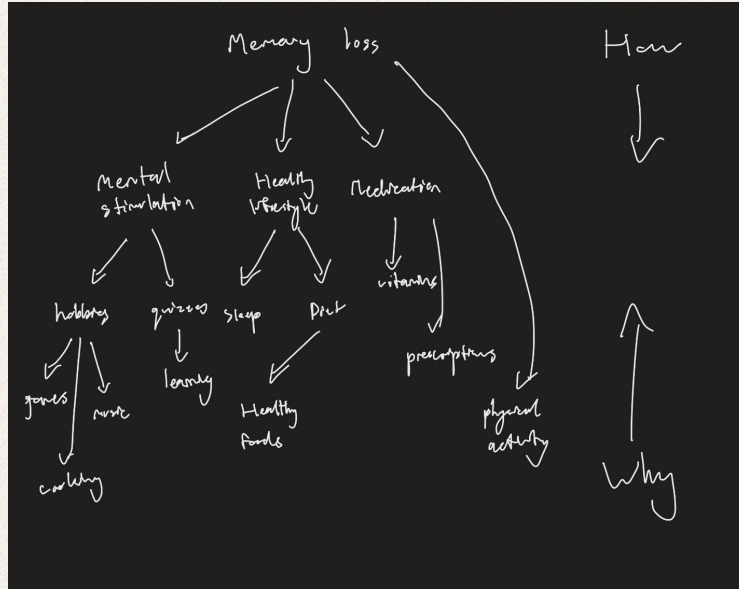
[9] H. M. Duvernoy. "The Human Hippocampus", Google Books. Accessed: Feb 22, 2025. [Online]. Available: [https://books.google.ca/books?id=5GkpPjk5z1lC&pg=PP1&redir\\_esc=y#v=onepage&q&f=false](https://books.google.ca/books?id=5GkpPjk5z1lC&pg=PP1&redir_esc=y#v=onepage&q&f=false)

[10] Y. Dudai. "The Neurobiology of Consolidations, or, How Stable is the Engram?", Annual Reviews. Accessed: Feb 22, 2025. [Online]. Available: <https://www.annualreviews.org/content/journals/10.1146/annurev.psych.55.090902.142050>



# Development Process Overview

- How-Why tree





# Tech Stack

Frontend	Backend
Next.js 15 (app routing)	Python
Tailwind CSS	Flask
Shadcn UI	OpenAI, Gemini API
Zod	OpenCV
TypeScript	





# Demonstration of Idea



# Caveats

- Ethical concerns regarding video recording and data privacy
- Skewed data due to patient awareness of recording
- Ease of use
- Forgetting to take the quiz
- This application does not account for all the symptoms of long term memory loss:
  - Mood/behaviour changes
  - Repeatedly asking the same question





# Future Endeavours

- Less intrusive video recording
- Improve data privacy
- Patient data integration with medical staff
- QoL:
  - Log-in
  - Benchmarks



# Q&A

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