3 Things Worth Learning This Week

A collection of resources to help you learn about neuroscience, AI, and robotics this week.

Action Potentials

Action potentials are the electrical signals neurons use to communicate. Understanding how they work is a great starting point for learning neuroscience and computational neuroscience.

Recommended Resource

- **Action Potential Explained**
  Action Potential Video

What You'll Learn

- Resting membrane potential
- Threshold potential
- Depolarisation
- Repolarisation
- Hyperpolarisation
- How neurons generate electrical signals

Retrieval-Augmented Generation (RAG)

RAG is a technique that allows AI systems to retrieve relevant information from external sources before generating an answer. It is a useful concept to learn if you're interested in AI, Large Language Models, and building your own AI applications.

Recommended Resources

- **RAG Explained**
  RAG Video 1

- **Building and Understanding RAG Systems**
  RAG Video 2

What You'll Learn

- What Retrieval-Augmented Generation is
- Why AI models need external information
- How documents can be stored and searched
- Embeddings and vector databases
- Retrieving relevant information for an LLM
- How RAG systems are built in practice

SLAM – Simultaneous Localization and Mapping

SLAM is one of the fundamental problems in robotics. It allows a robot to build a map of an unknown environment while simultaneously figuring out where it is within that environment.

Recommended Resource

- **SLAM Explained**
  SLAM Video

What You'll Learn

- What SLAM is and why robots need it
- Localization and mapping
- How robots use sensor data to understand their environment
- The relationship between a robot's position and its map
- How LiDAR and other sensors can be used for SLAM
- Foundations for autonomous mobile robotics

Final Note

You don't need to master these subjects in one week.

The goal is simply to understand the fundamentals, follow your curiosity, and start building from there.

Learn something new. Build something with it. Repeat.