



The Nature of Predictions

Negative Feedback Loops \wedge P.I.D Controllers

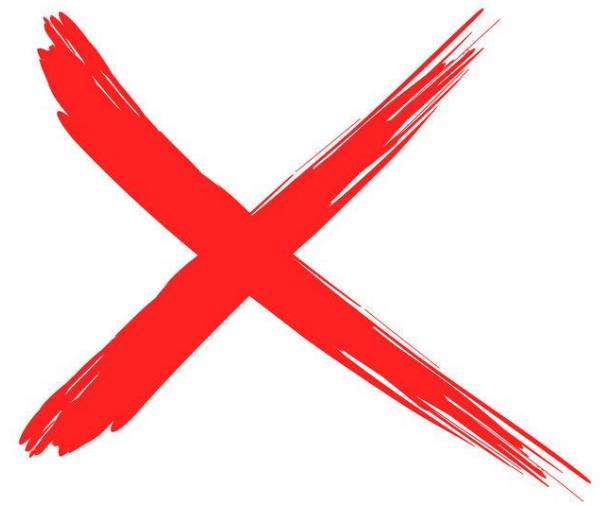
Internal Training Session

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“The purpose of a prediction is to help with planning and decision-making in the present by anticipating possible future developments.”



Gemini

Predictions are everything in life

(and in other places)

Who predicts?

- **Bacteria**
- **Rabbits**
- **Humans**
- **Societies**

What do we predict?

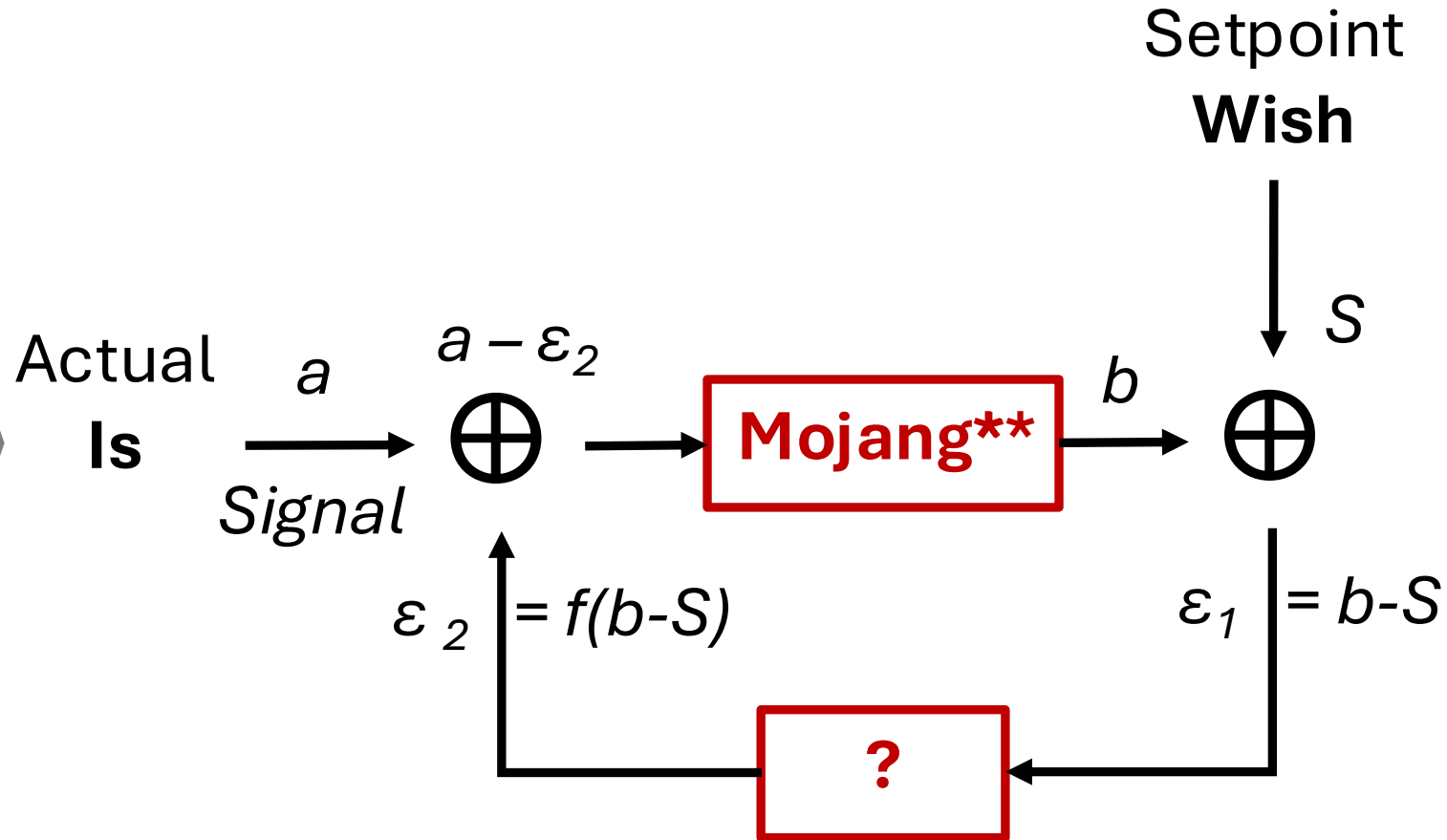
- **Where to find heat**
- **Where to eat safely**
- **How long is today's commute**
- **How much taxes will we raise**

But how do they happen?

The negative feedback loop (NFL) makes life possible

Control Theory*

- Human thought
- Stereo amplifiers
- AI & LLM



What
is the
question
mark?

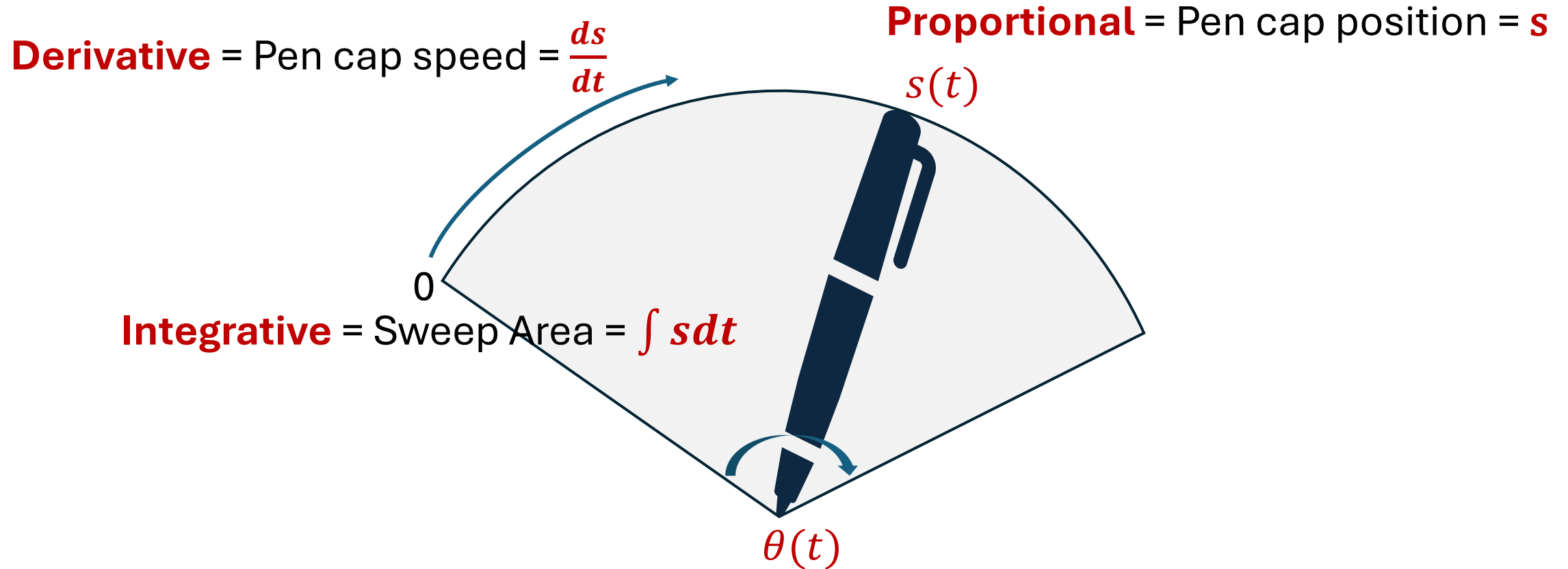
* See [Shimrock](#)

** Also known as **Plant**

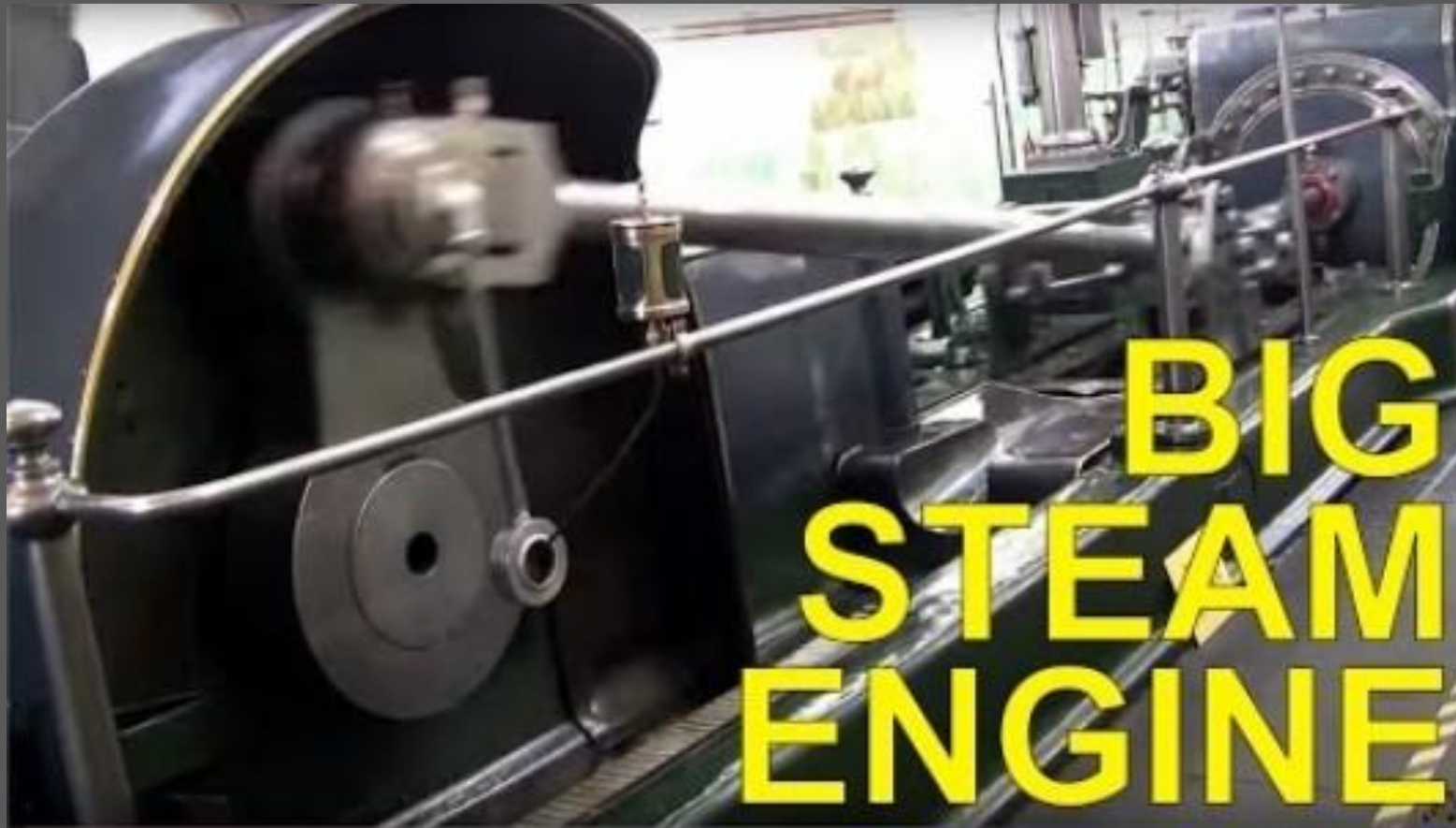
Demo

The ? is a P.I.D controller

Example: Imagine a pen sweeping around the nib from left to right

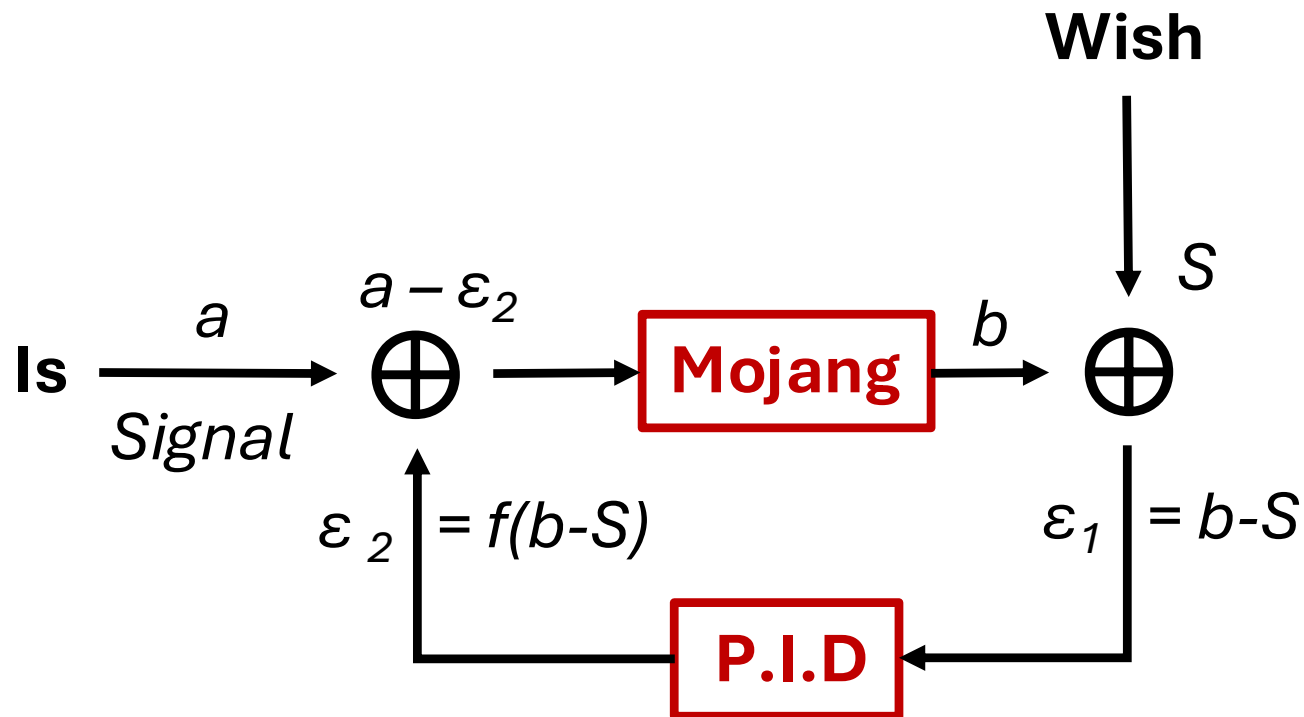


Shown like this to correspond to a live video demonstration



Steam engine with P.I.D controller (the vertically rotating part seen at 49s)

Predictions are negative feed loops governed by P.I.D controllers



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1. Movements
 2. Instincts
 3. Reasoning
 4. Consciousness

Similar to **Backpropagation** in AI

How does Tellusant use this?

- **Data harmonization**

- They usually put in the data as-is without harmonizing between datasets. This is an **open loop** system without **NFL**
- Tellusant makes sure the data is harmonized so the end point of the first data set matched beginning point of the second dataset. This is **NFL** with a P regulator

- **Short-term statistical models**

- We, as everyone else, uses a NFL with P.I.D regulator

- **Long-term forecasting**

- We use mainly a P regulator, but there are opportunities to work with P.I.D

- **Regression forecasting**

- Federal Reserve uses NFL with P
- Our innovation is NFL with P.I.D