Response Matrix Identification and Control

Slow Feedback Controller Design for XFEL Using SINDy, LQR, and Kalman Filtering

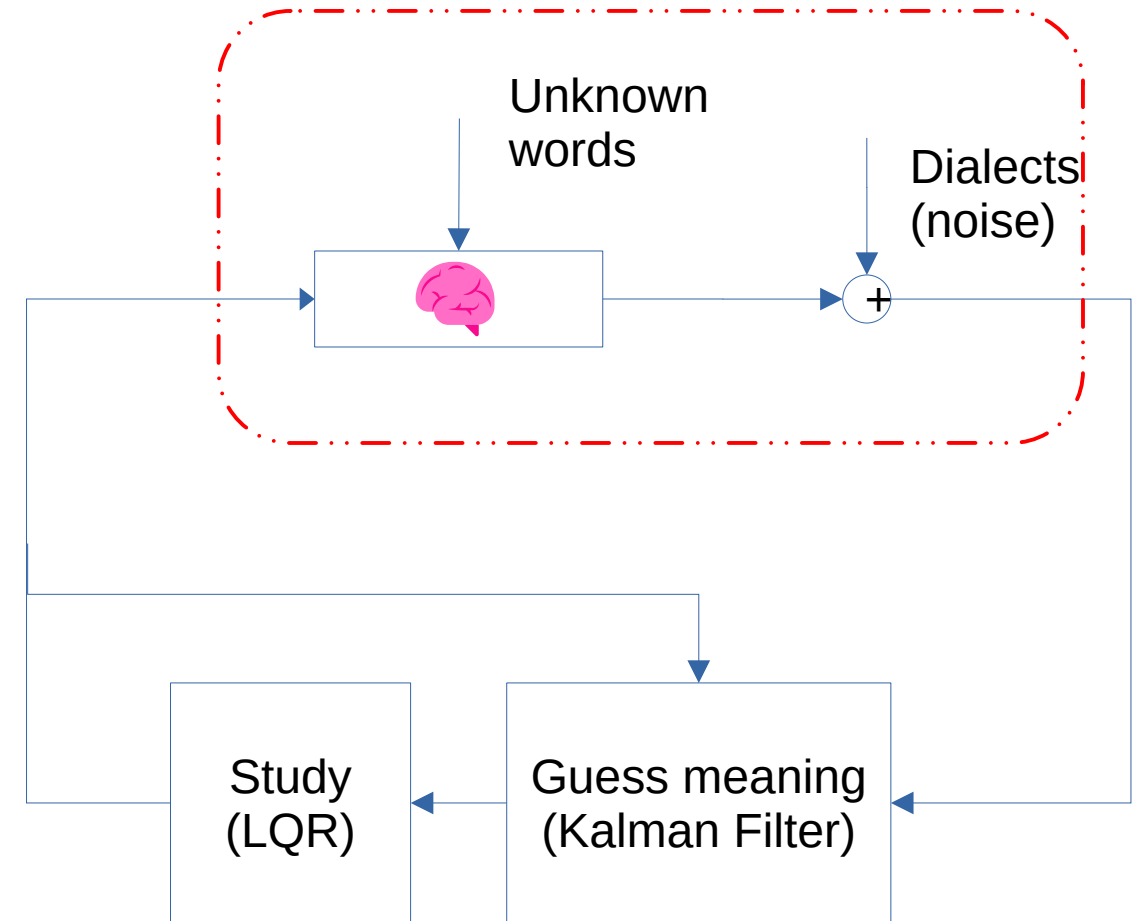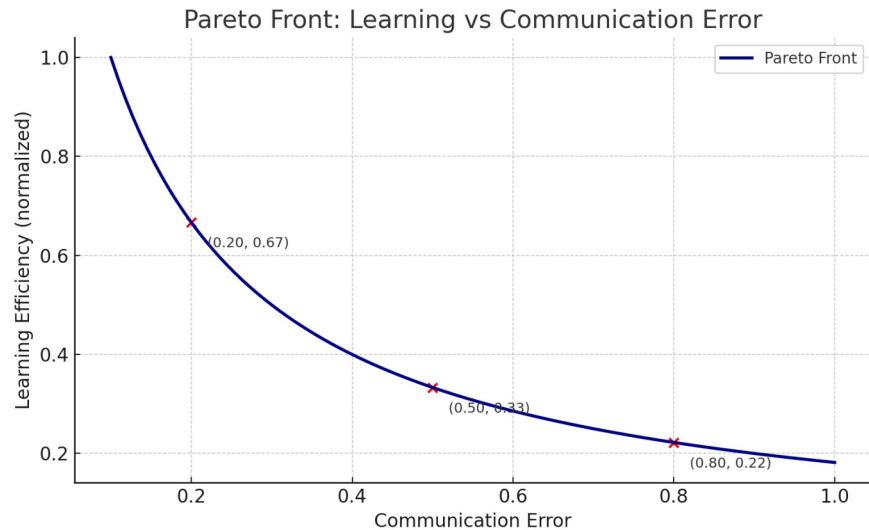Bindu Sharan, Marie Kristin Czwalinna and Annika Eichler

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HELMHOLTZ

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Language Learning = Control System

An Intuitive Analogy

Imagine learning a new language:

- Build knowledge (system)

- Hear dialects (noise)

- Guess meaning (Kalman Filter)

- Choose when, how and how much to study (LQR)

Pareto Front: Learning vs Communication Error

What's in Poster

Slow feedback control for XFEL

XFEL

- Input: SumVoltage and Chirp

- Output : Beam arrival time and beam compression

- Model 🧠 : Response Matrix

- LQR objective: Have a specified arrival time and compression of beam with minimum change in Sumvoltage and Chirp

For more details come to my Poster