Building an MCP Server for LASSO: *Automated Agentic Workflows for Test-Driven Software Experimentation*

Master Team Project

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Vibe Coding

Generated with ChatGPT

The Vision – Vibe Experimentation

Current – Manual Workflow

- LASSO enables powerful test-driven software experiments (TDSEs)
  - A Large-Scale Software Observatorium for the Dynamic Selection, Analysis and Comparison of Software
- Users manually orchestrate complex workflows using LASSO's specialized languages and data structures (e.g. LSL – a DSL for study pipelines)
- Rich, collected (run-time) software behavior data, stored in a Stimulus-Response-Hypercube (SRHs), awaits intelligent exploration and analysis

Desired – Automated Workflow

- Users conduct TDSEs in natural language
- AI agents conduct (parts of) experiments with high automation
  - i.e., agentic workflows
- Intelligent workflow composition and execution
- Use Natural language to explore SRH data

The Vision – Vibe Experimentation

Current – Manual Workflow

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analysis

Desired – Automated Workflow

- Users conduct TDSEs in natural language

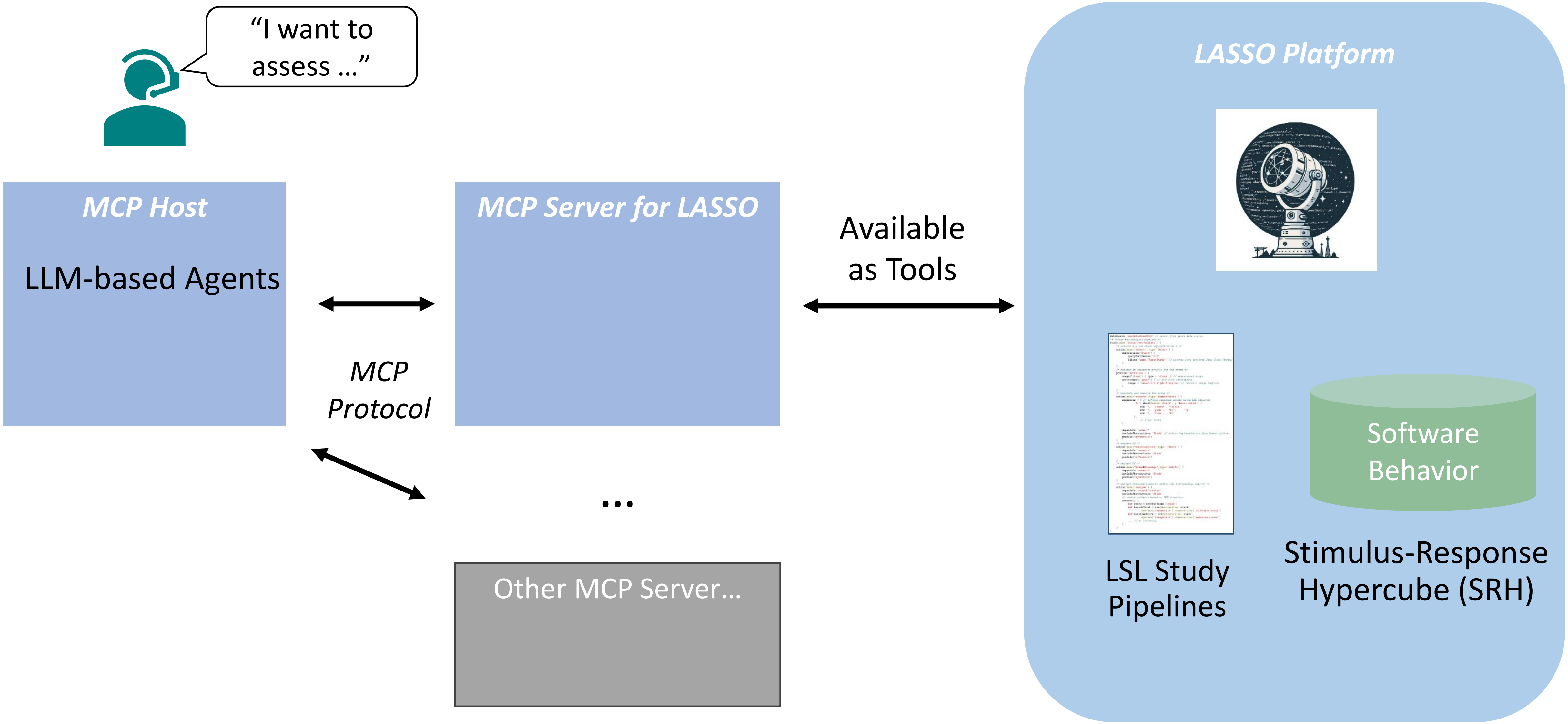
Build an MCP Server (e.g., FastMCP) and offer LASSO “Tools” via Model Context Protocol (MCP)

→ Given: LASSO platform - automate the gathering and analysis (including static and dynamic analysis) of large numbers of software implementations (https://softwareobservatorium.github.io/)

→ Select LLMs for Software Engineering tasks (function calling support …)

→ Use LangChain for LLM-based Agents (https://www.langchain.com/langchain)

Build an MCP Server (Model Context Protocol)



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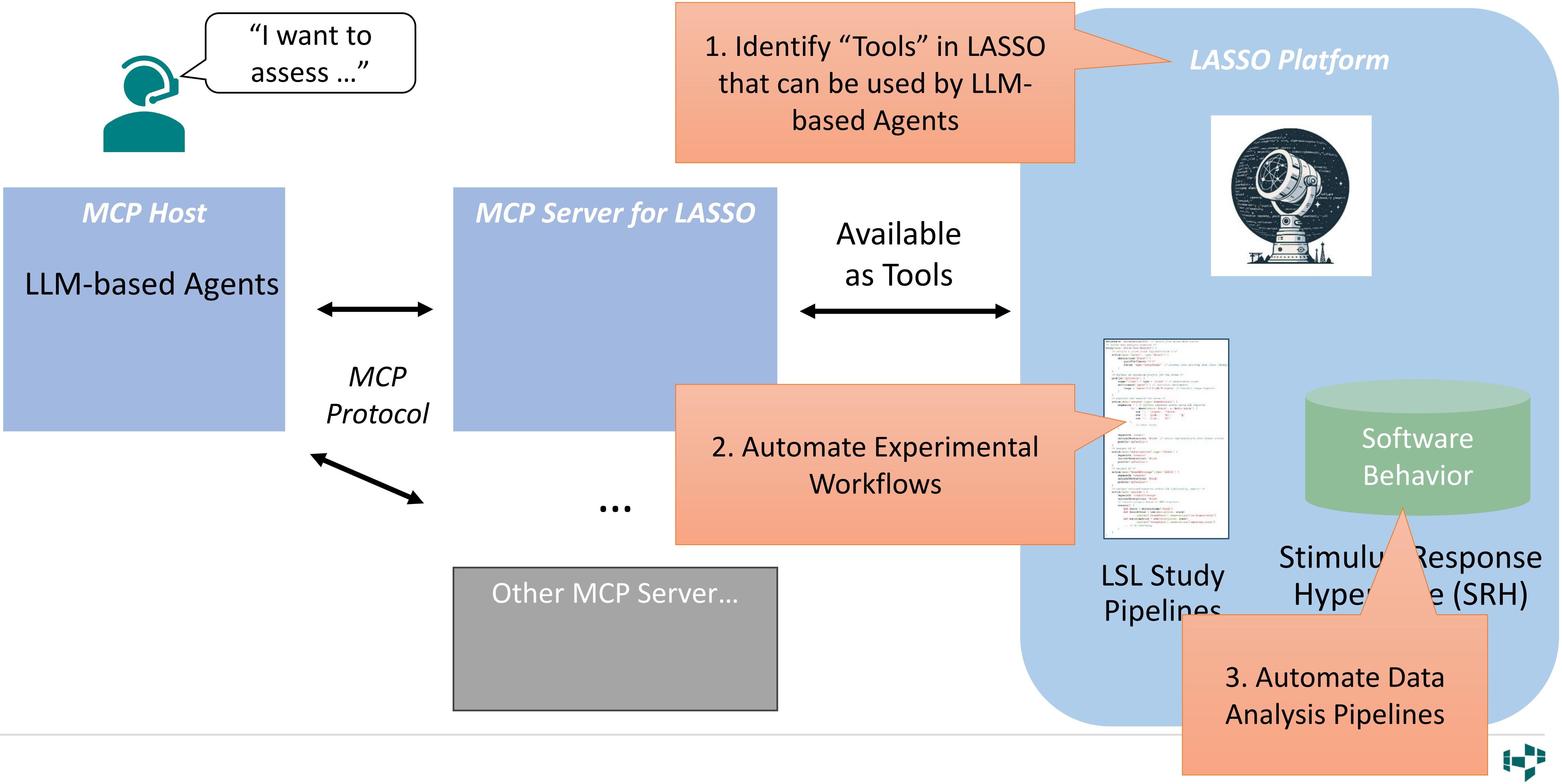

Requirements

- Main Supervisor
  - Marcus Kessel
- Participants
  - 3-6 students
- Length
  - 6 months
- Prerequisites
  - Programming experience (Python, Java or similar)
  - Data Analysis skills
  - Recommended: Familiarity with LLMs + Agents (e.g., LangChain etc.)
- Language
  - English
- Organization
  - Goals and timetable defined by agreement with the supervisor
- Applicable to MMDS: yes
- Online: Yes

Q/A

Thank You!