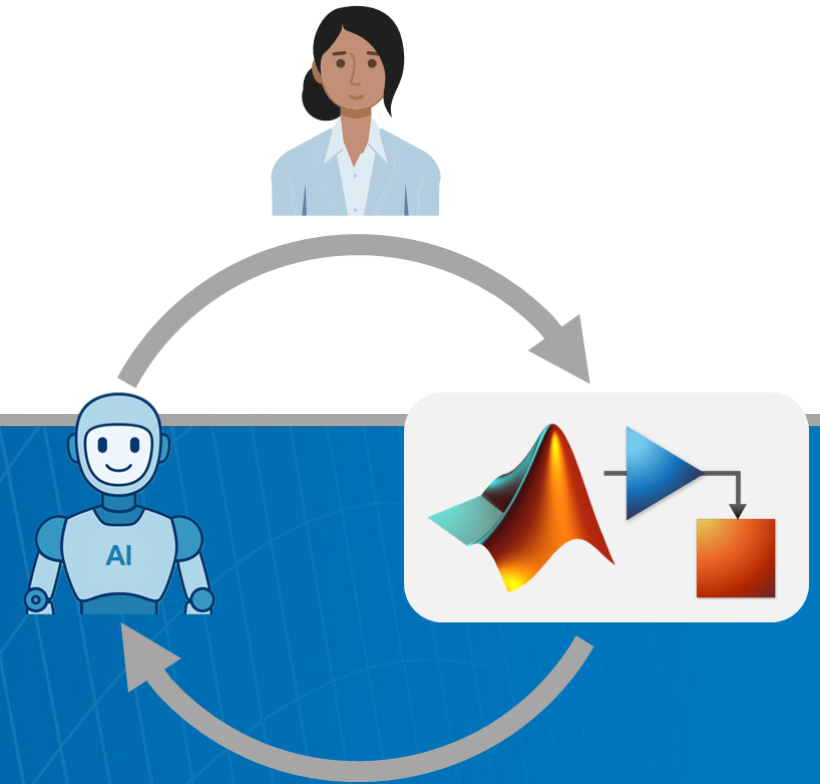


Accelerating the Pace of Engineering, Science and Mathematics with Agentic AI

Technical Computing Camp Brno

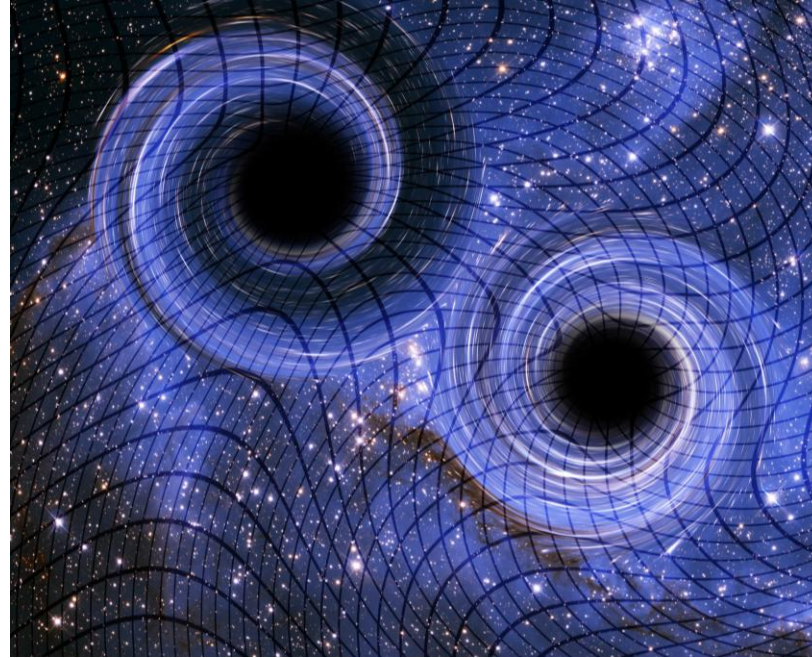
By Tanya Morton
Global Director Customer Success Engineering
10 September 2026



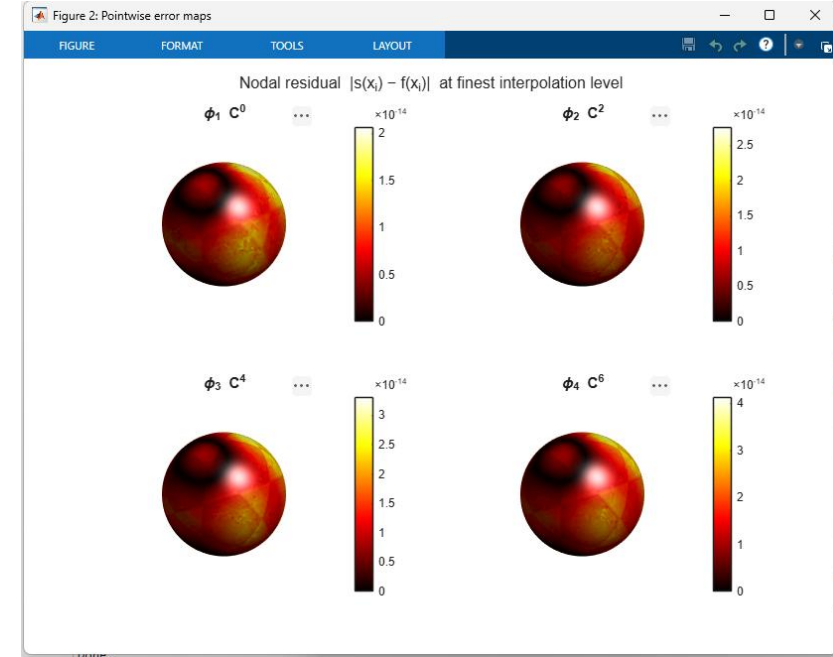
A new way of working has arrived for all of us



Engineering

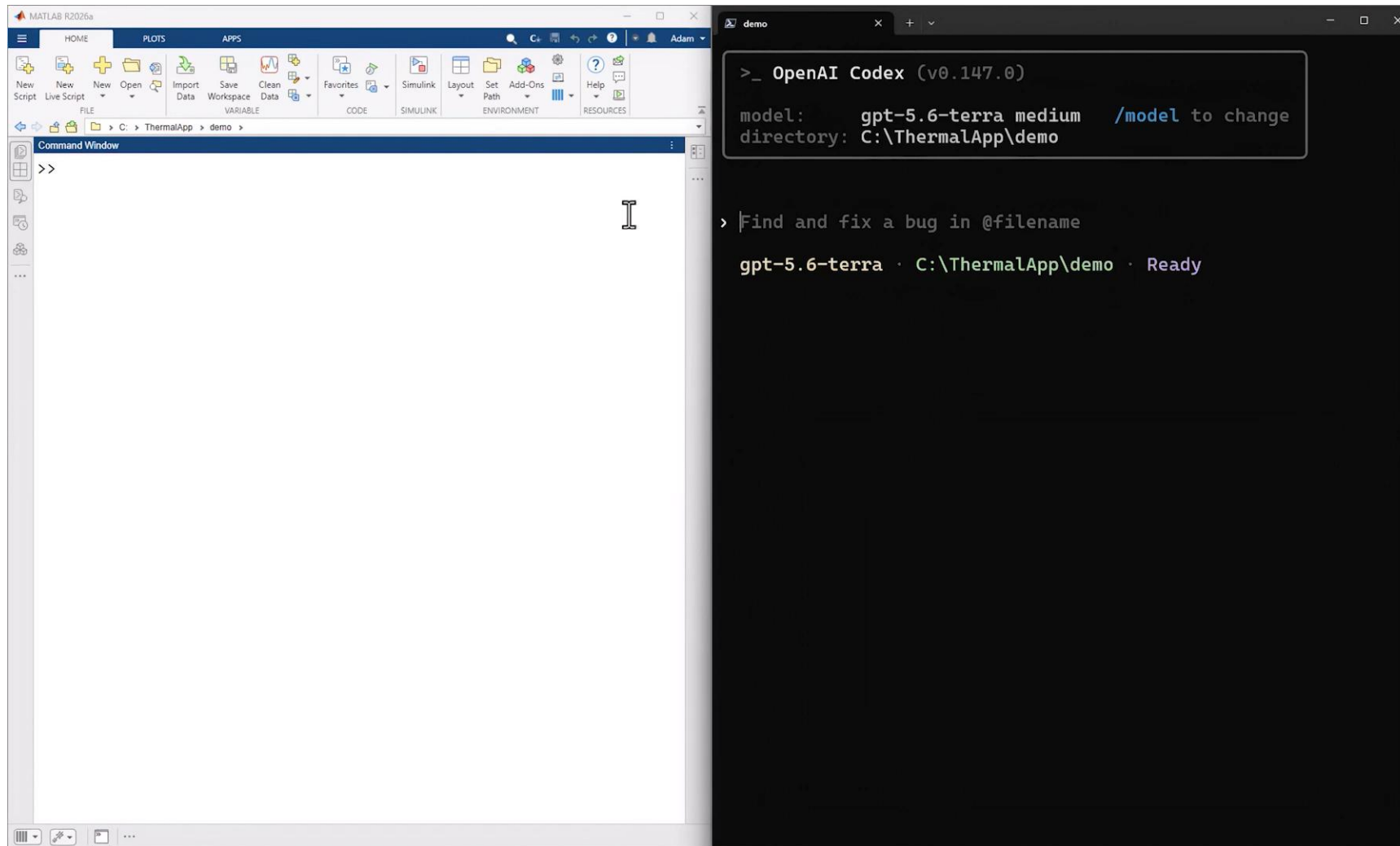


Science



Mathematics

AI is accelerating creation



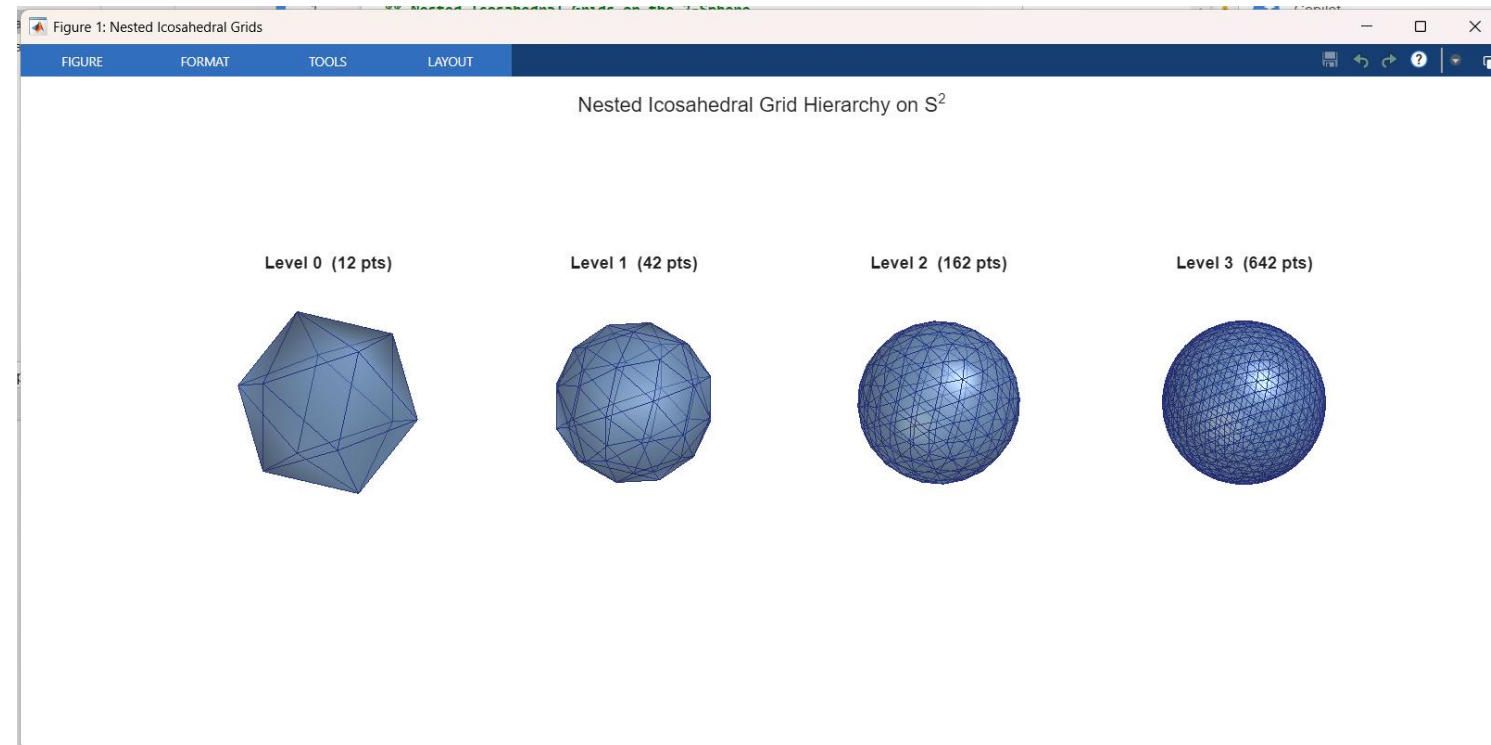
My Magic Moment in Mathematics with Agentic AI – 31 May 2026



Prompt:

Create nested icosahedral grids on the 2-sphere using MATLAB.

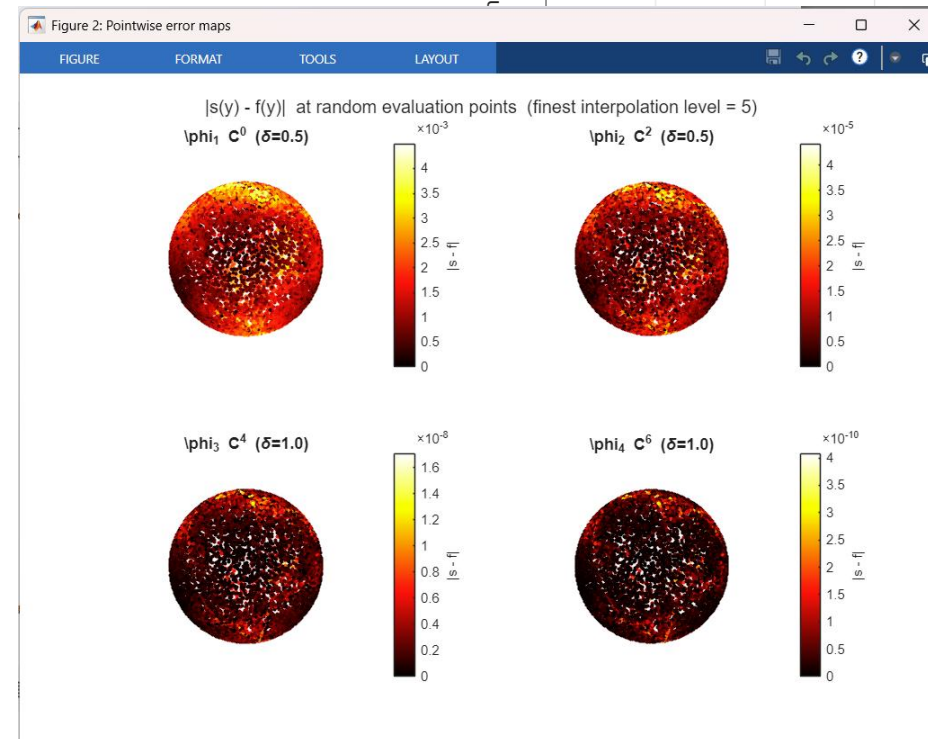
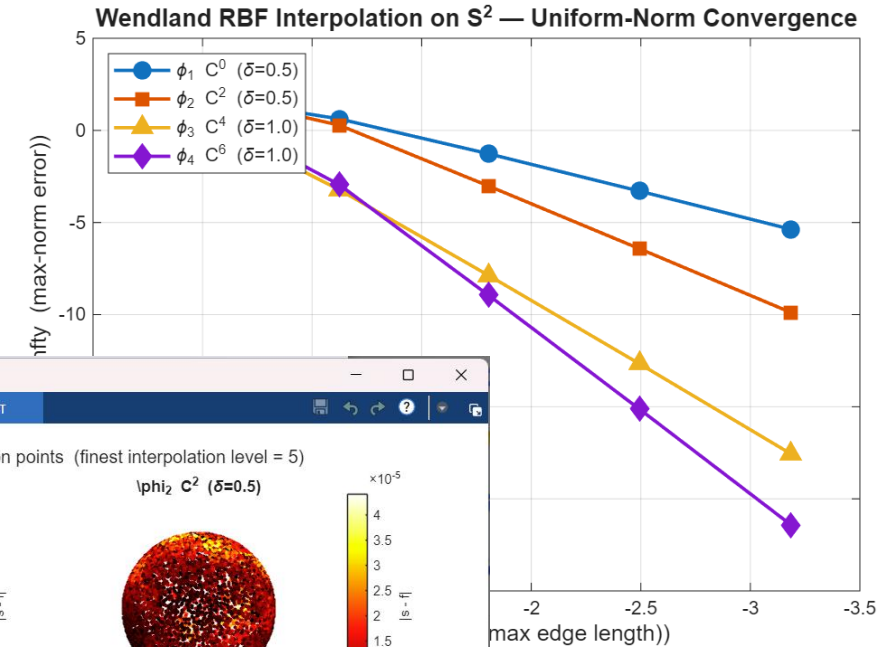
Result: 164 lines of clean MATLAB code and a visualization



My Magic Moment in Mathematics with Agentic AI

- Reproduced a numerical experiment from my PhD in MATLAB that afternoon
- Originally written in Fortran over several months in 1999/2000

$$\|f - s\|_{L_\infty} \leq Ch^\alpha \|f\|_{\varphi^* \varphi}$$

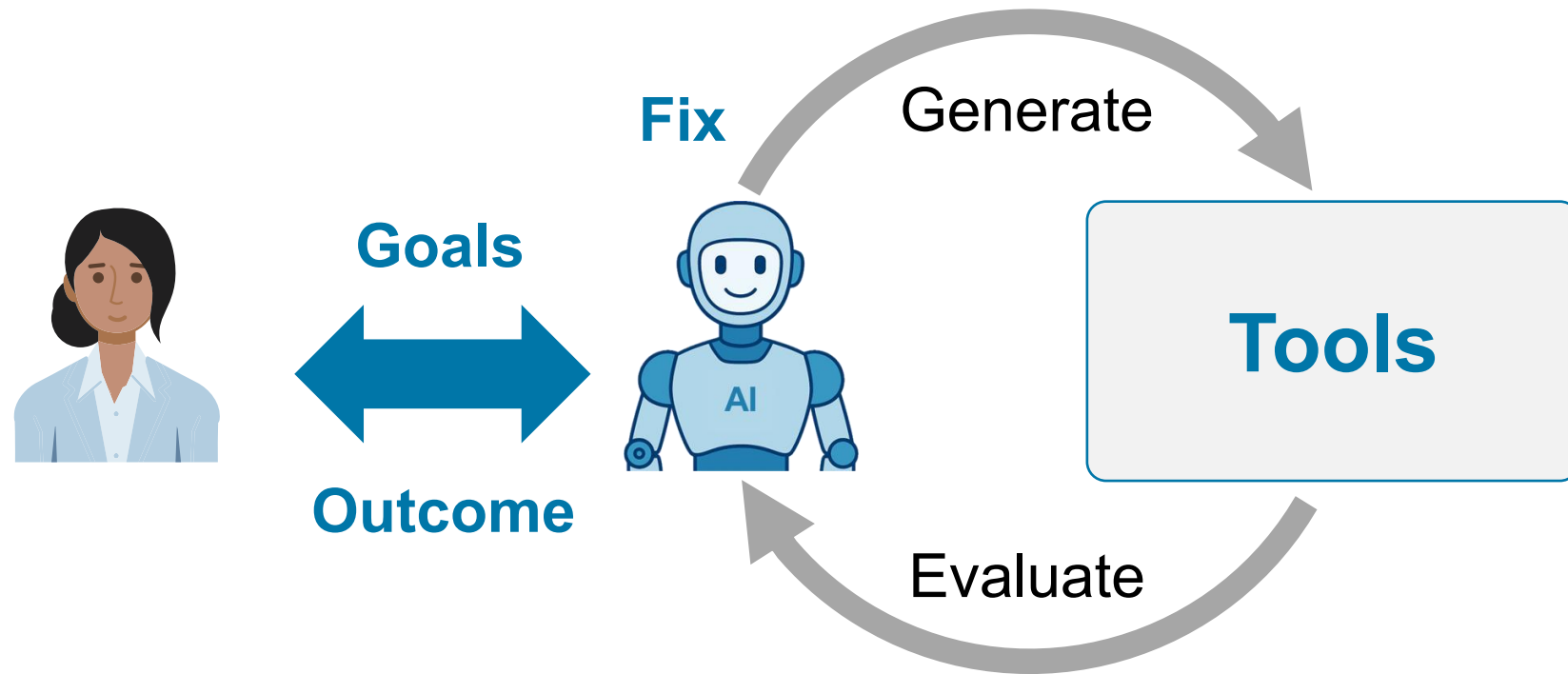


The ratio of Lev 3 -> Lev 4 uniform norm approximation errors in my PhD were 8.051 (C^0), 31.73 (C^2), 125.8 (C^4), and 471.3 (C^6). Take the $\log_2$ of these 4 numbers and compare with your Lev3 ->4 results

Taking $\log_2$ of the four PhD ratios and laying them alongside the current results:

Basis	PhD ratio (Lev3→4)	$\log_2(\text{ratio})$	Our Lev3→4	Difference
C^0	8.051	3.008	2.94	+0.07
C^2	31.73	4.986	4.94	+0.05
C^4	125.8	6.975	6.96	+0.02
C^6	471.3	8.881	8.97	-0.09

The Agentic Loop



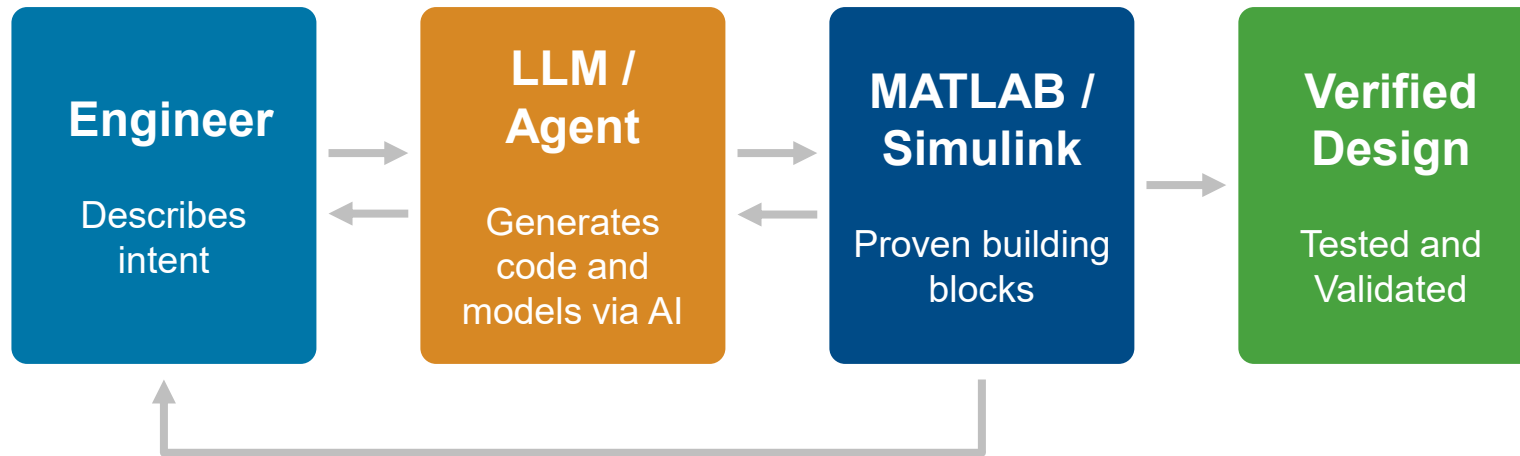
Speed comes from the agent
Trust comes from the workflow

Agentic Engineering Workflow

AI changes creation speed, not engineering accountability



AI changes creation speed, not engineering accountability

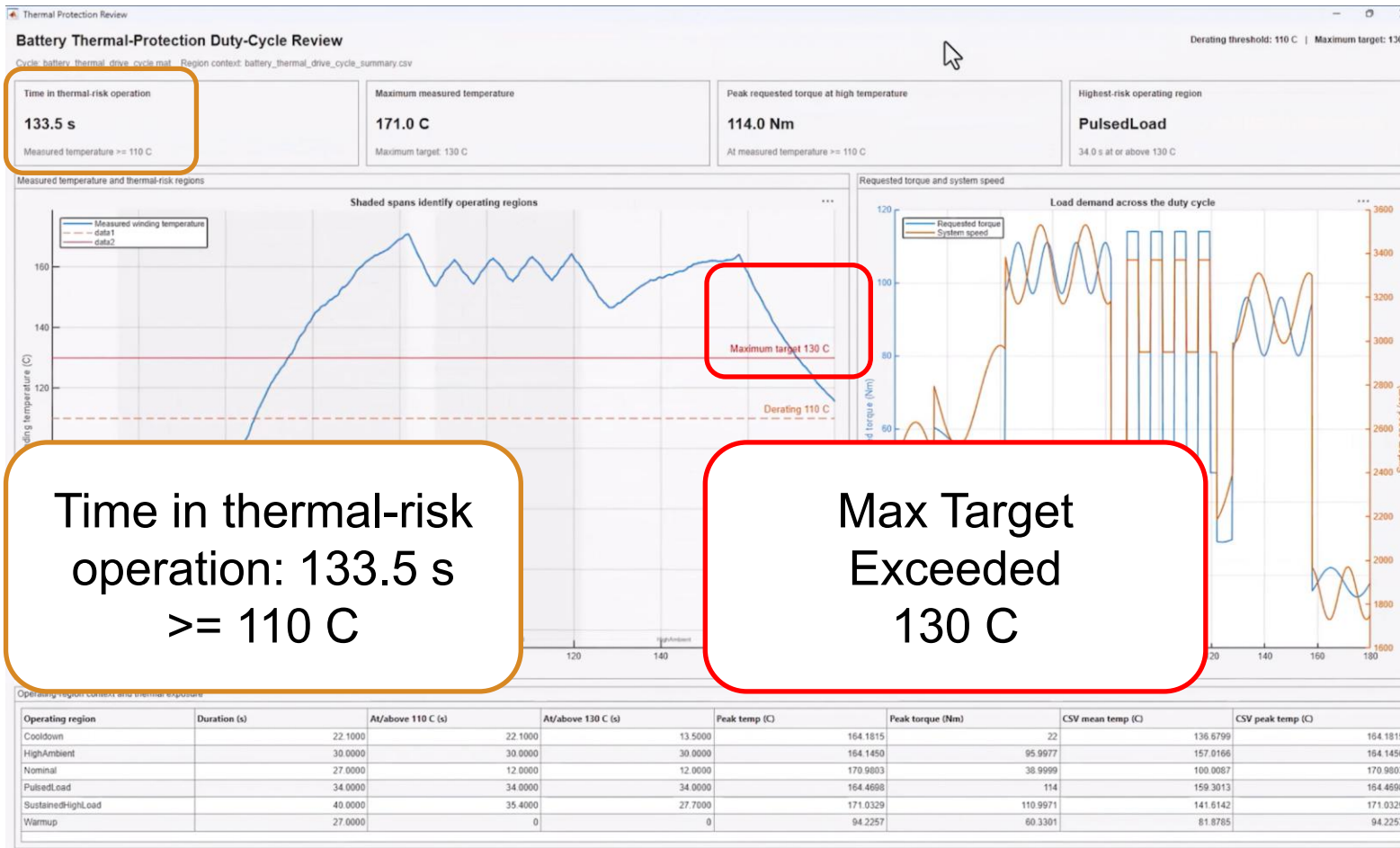


What doesn't change when you add AI:

The engineer owns the design.

The same engineering evidence verifies it.

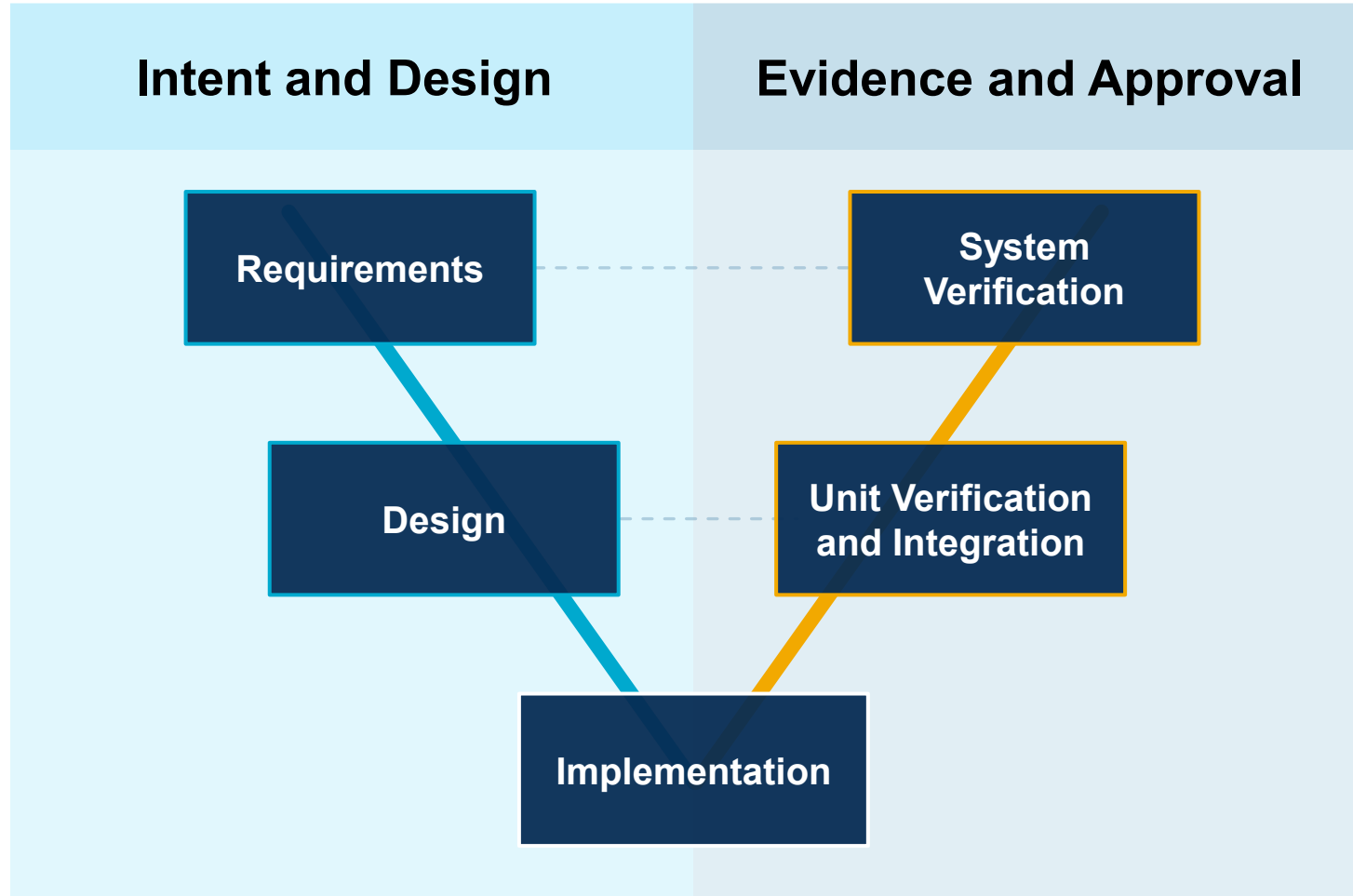
Fast creation is not rigor



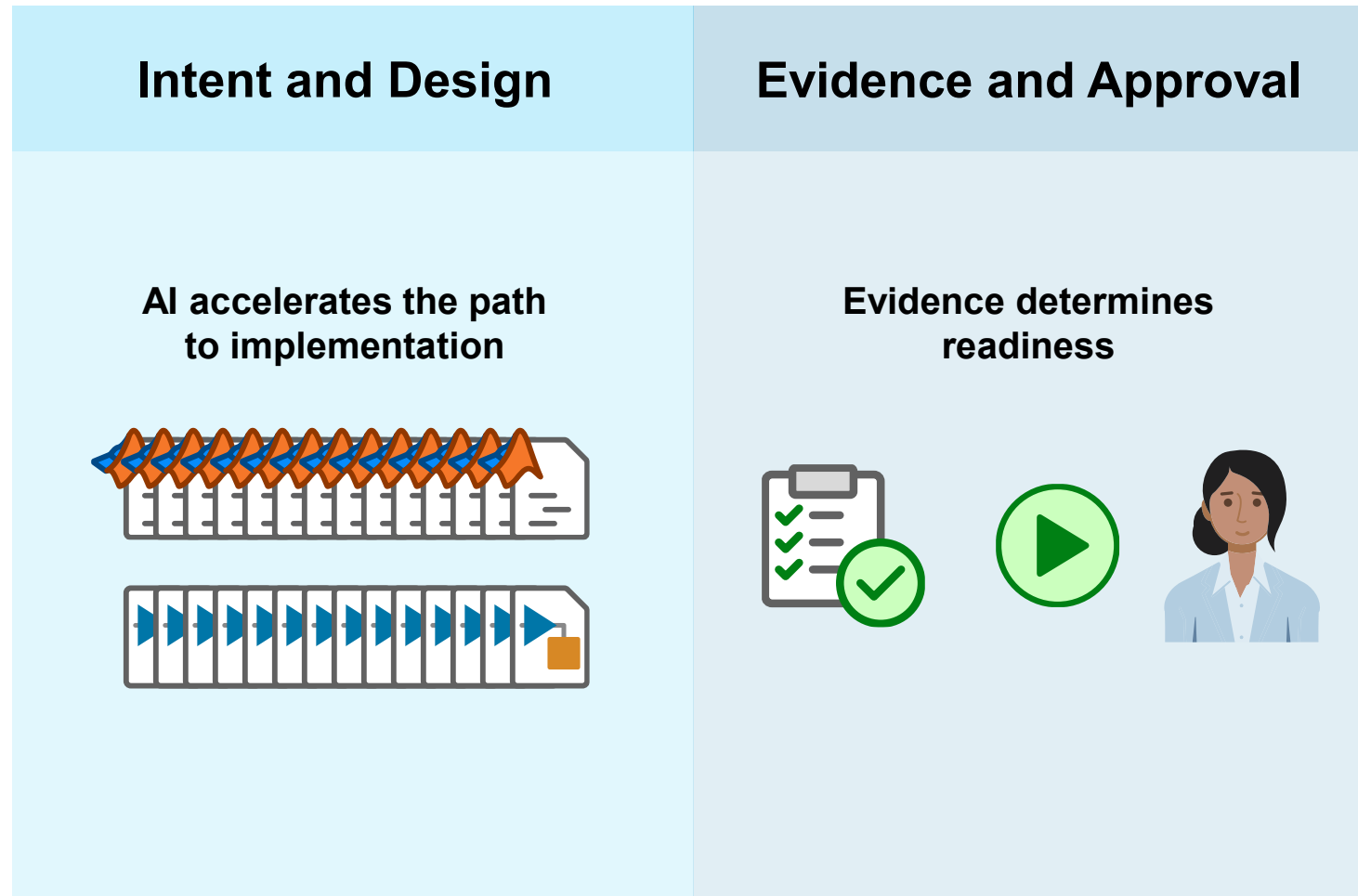
Approval questions

- Did we define the intent clearly?
- Can we trace the result to requirements?
- Is the evidence strong enough to act on?

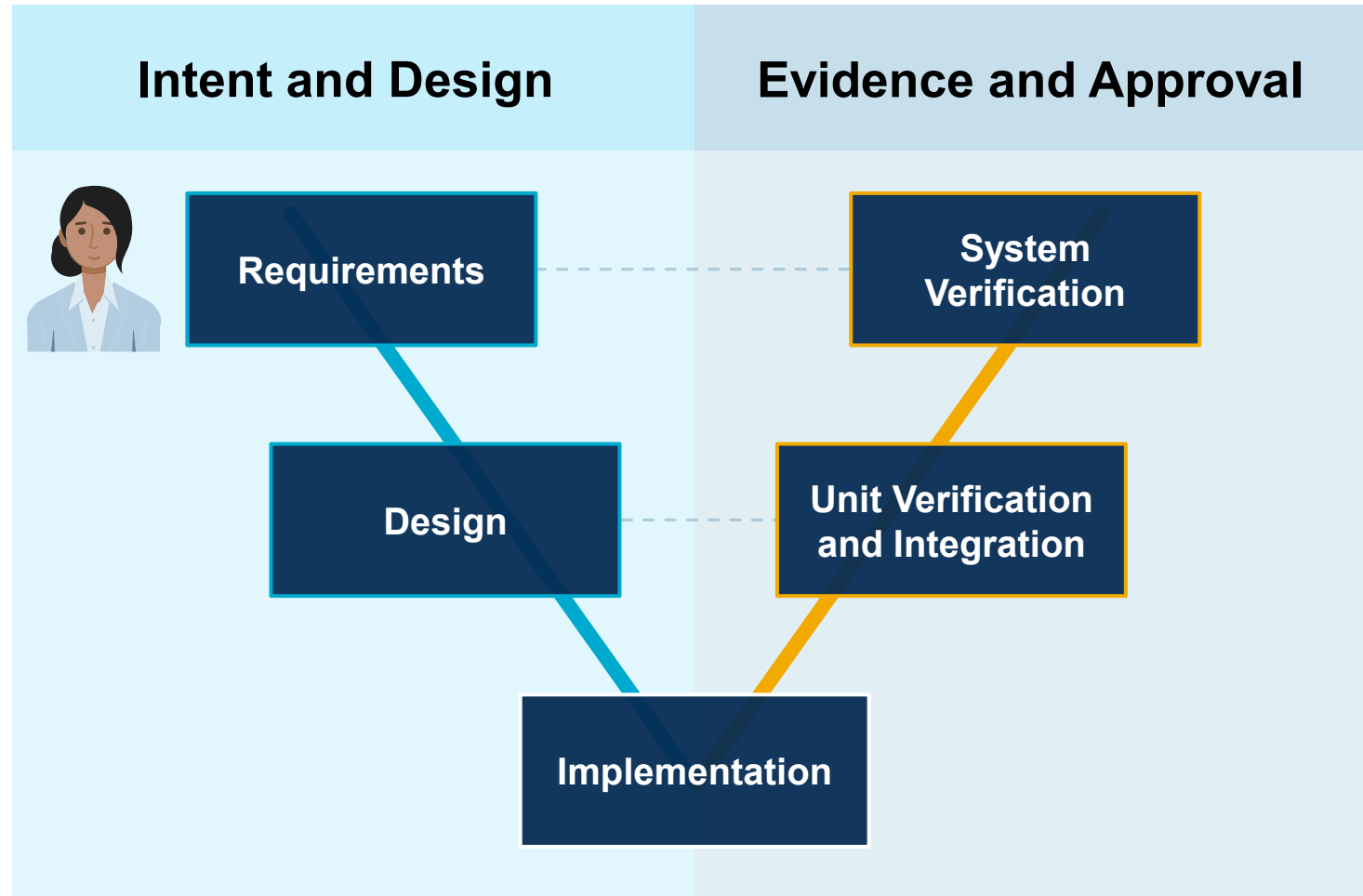
Model-Based Design is the evidence map



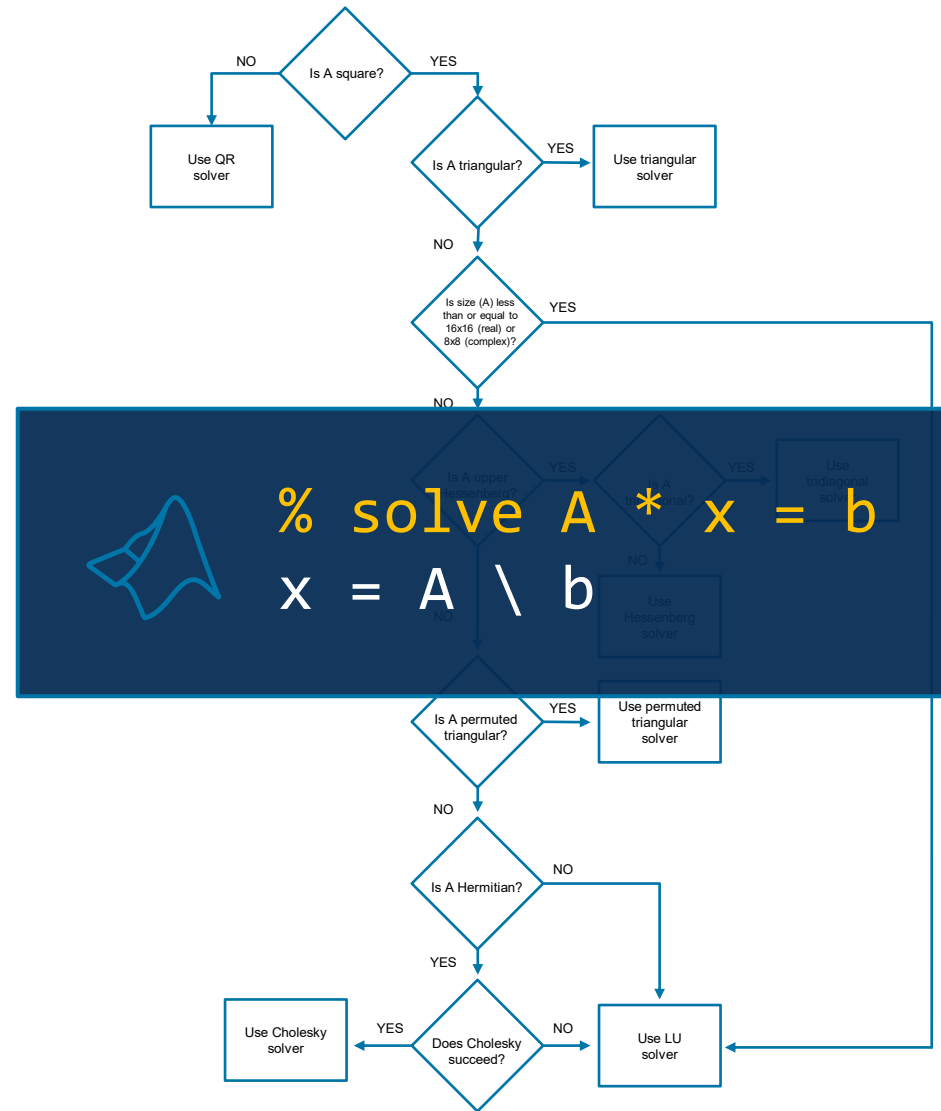
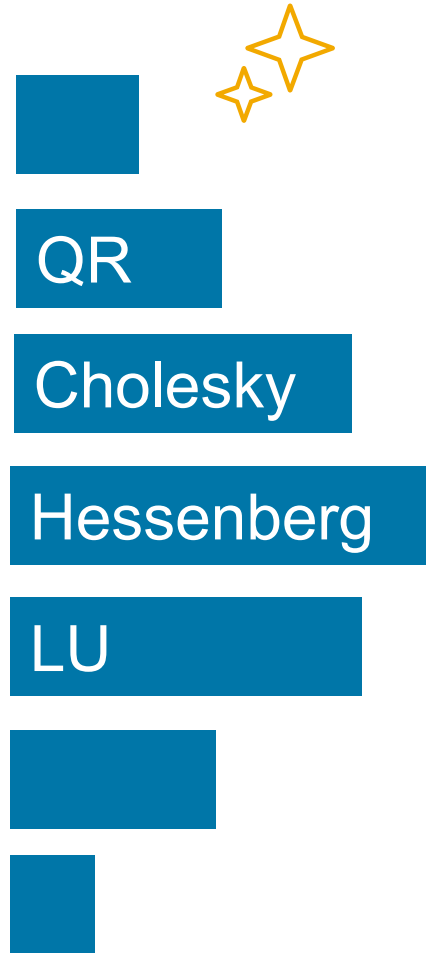
Agentic AI can accelerate creation, but the evidence needs to keep up



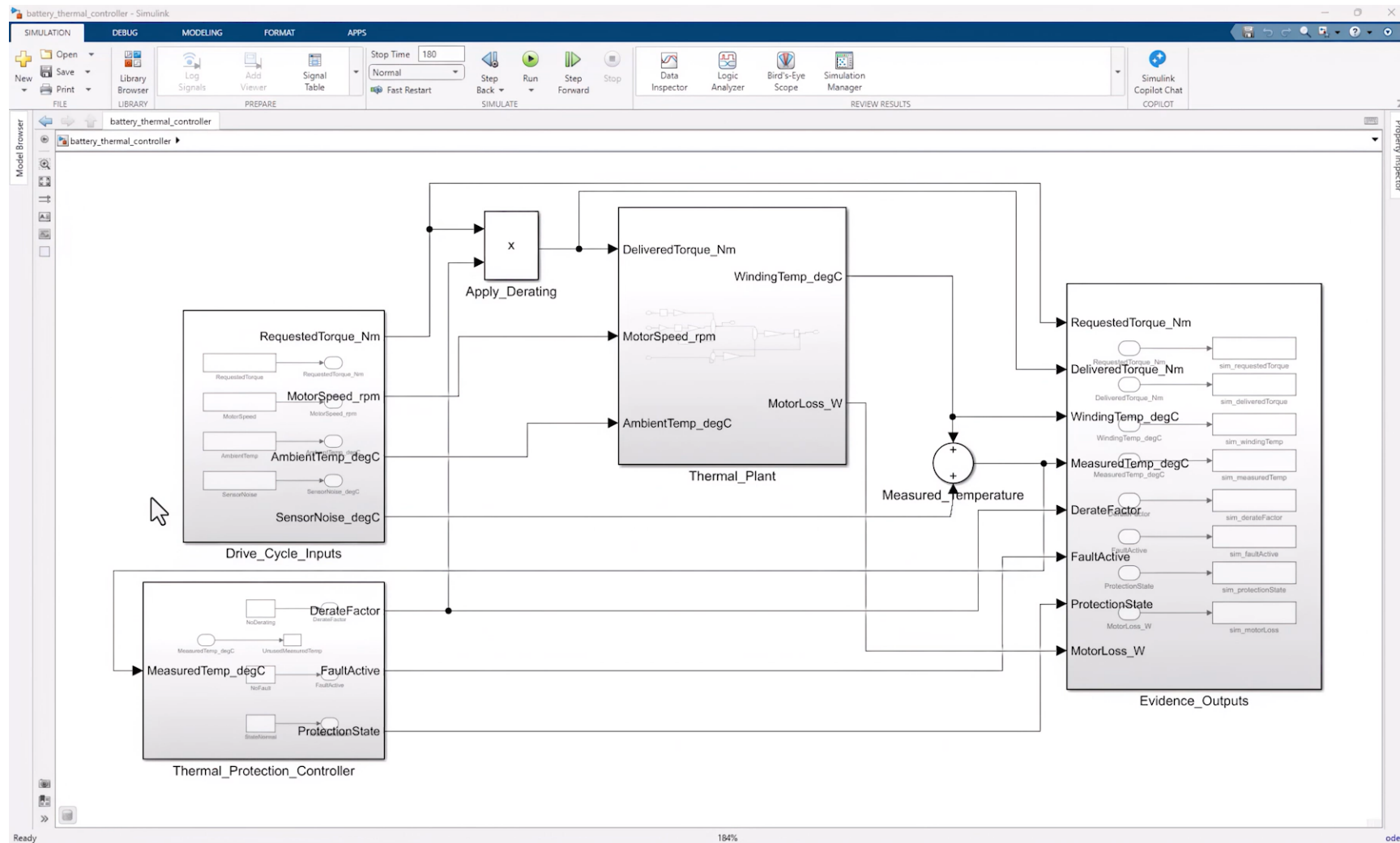
Before AI creates, you set the foundation



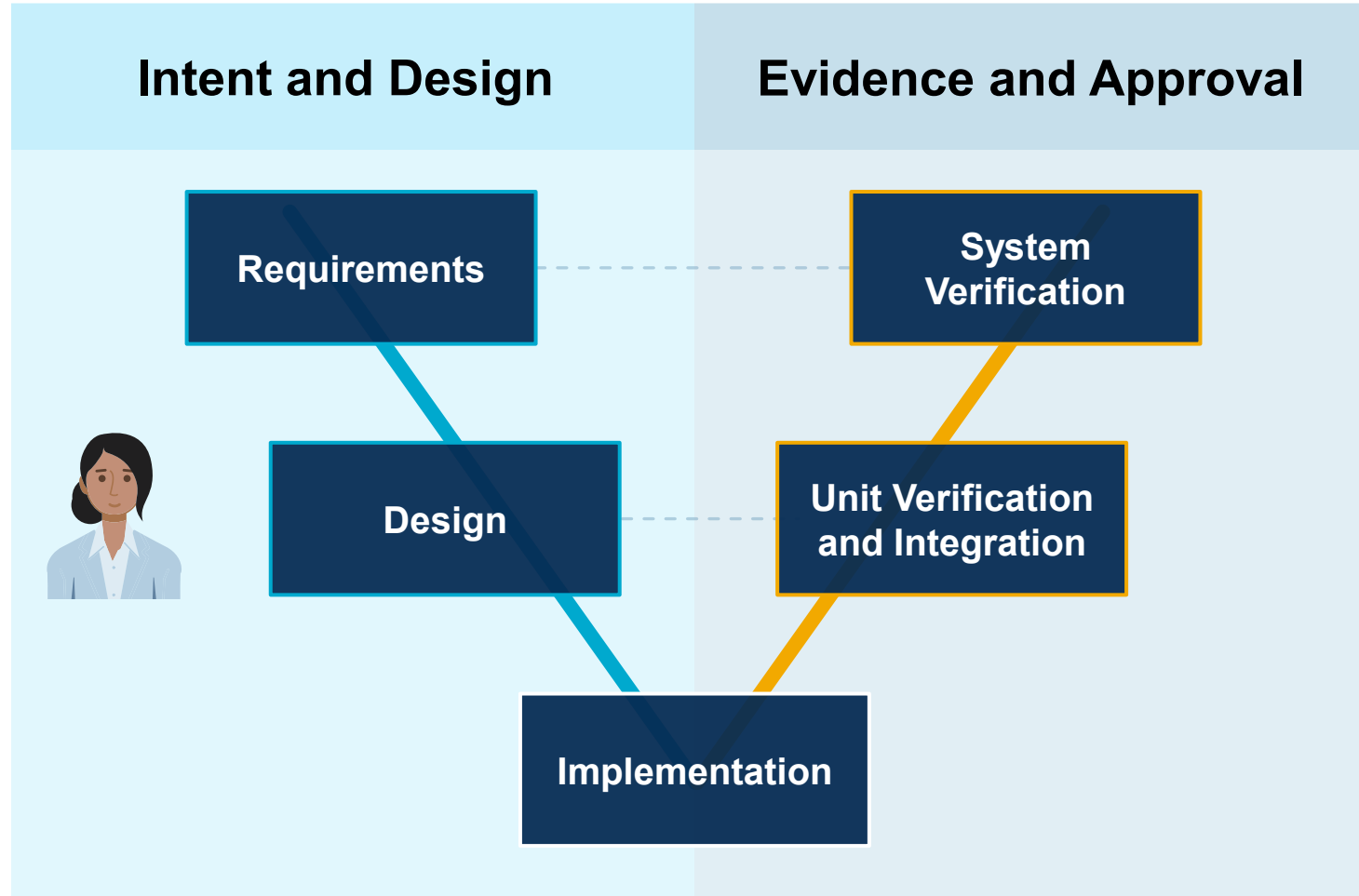
Move faster with proven engineering foundations



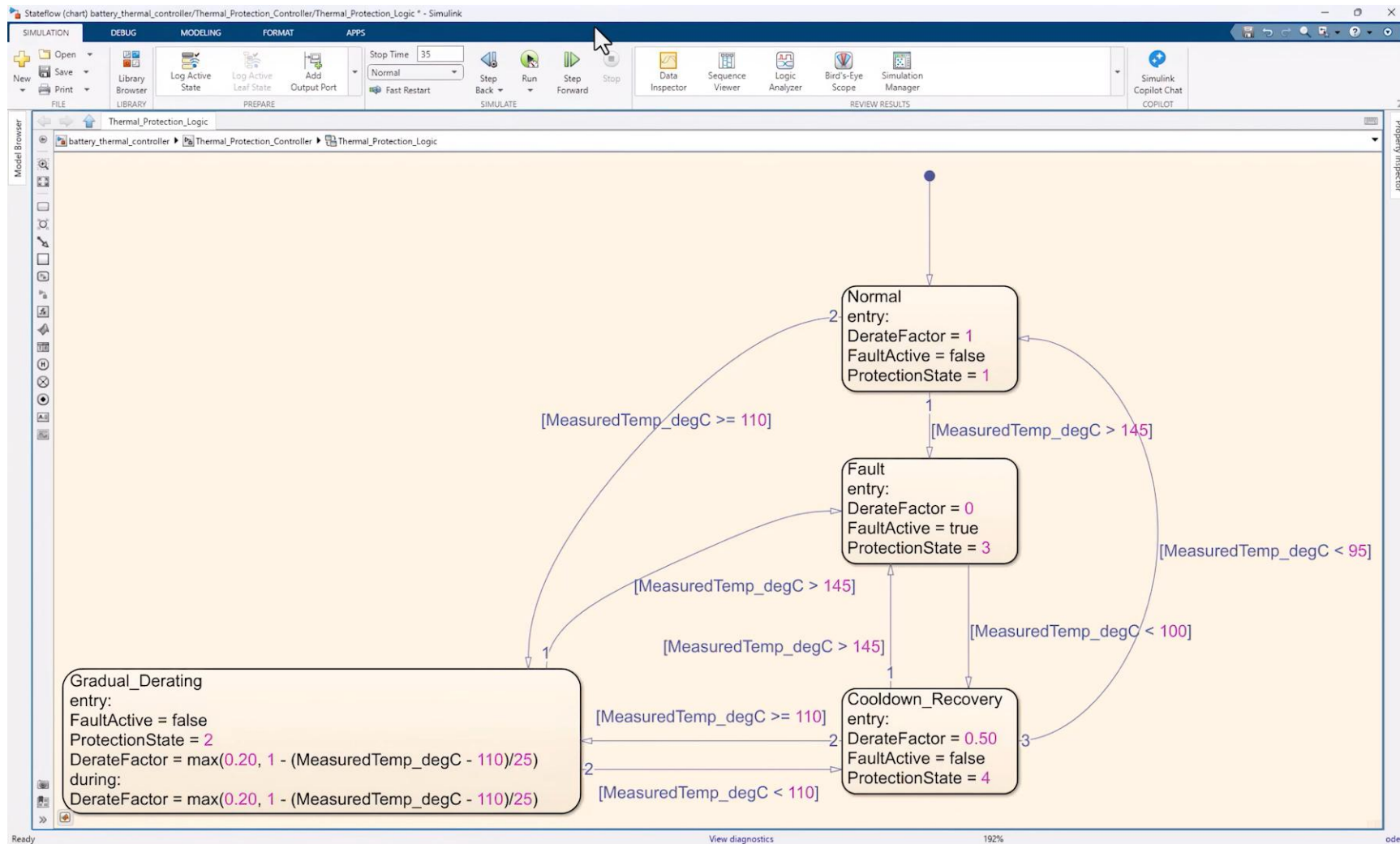
Clear requirements make AI output traceable



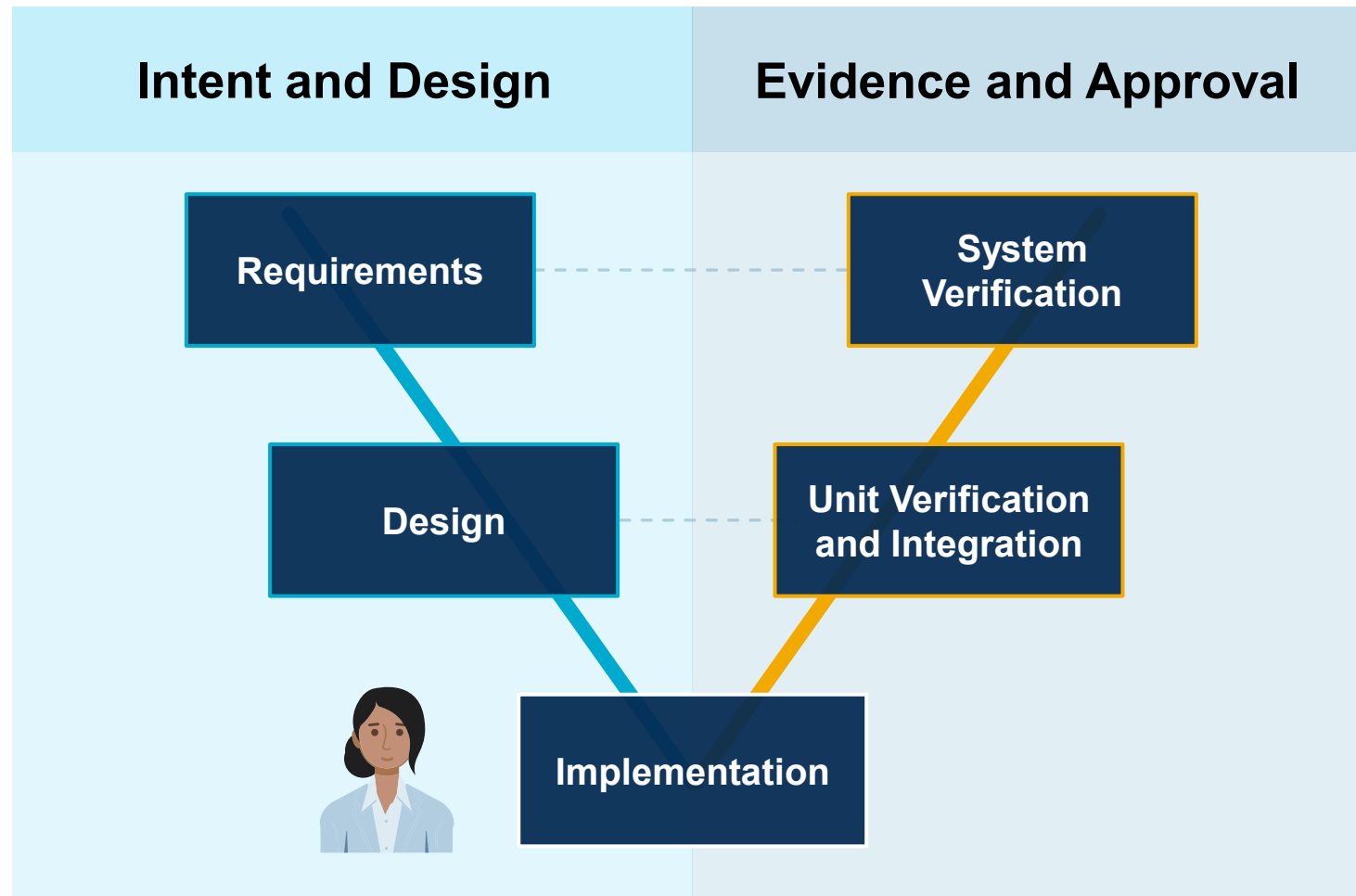
Understand what AI creates



Models expose behavior that code can hide



Carry engineering intent into implementation



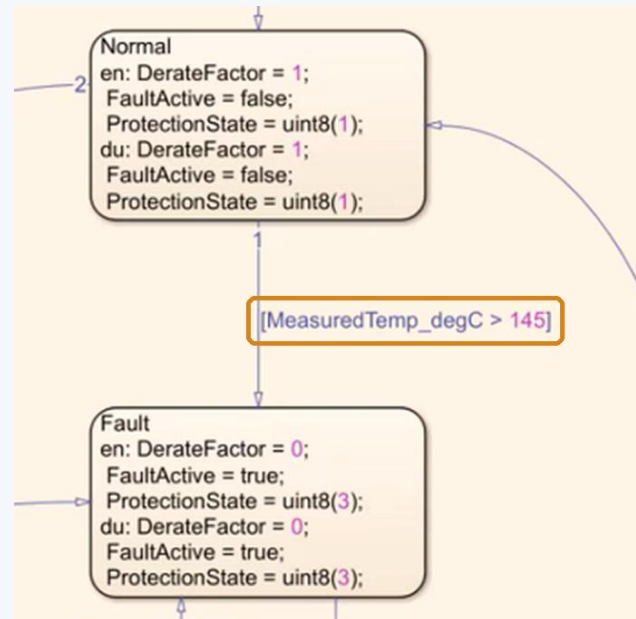
Code generation preserves what you reviewed

1 · REQUIREMENT

BAT-TP-005 Fault threshold

If the measured winding temperature exceeds **145 °C**, the controller shall transition to the Fault state and command zero torque.

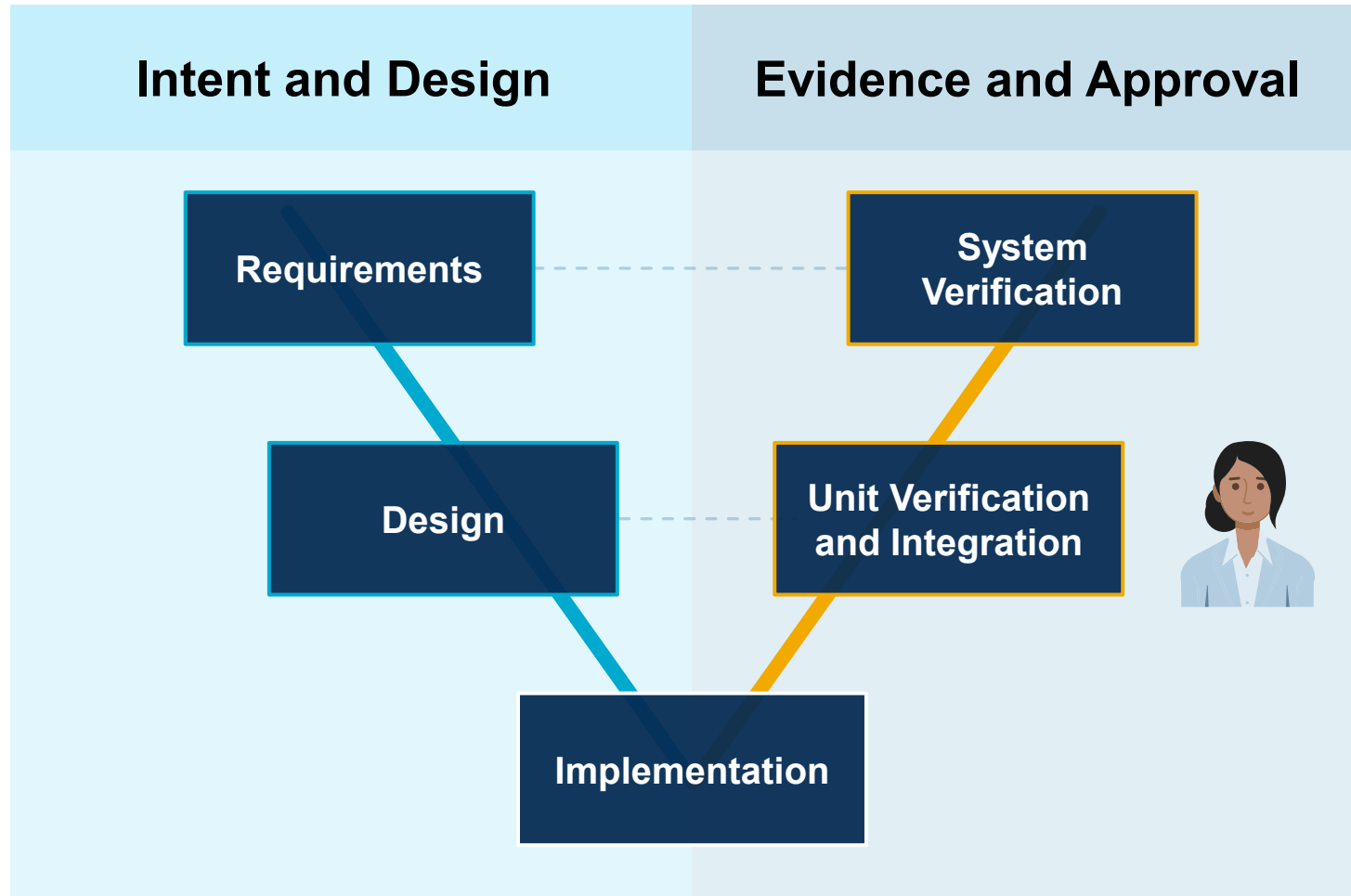
2 · REVIEWED MODEL



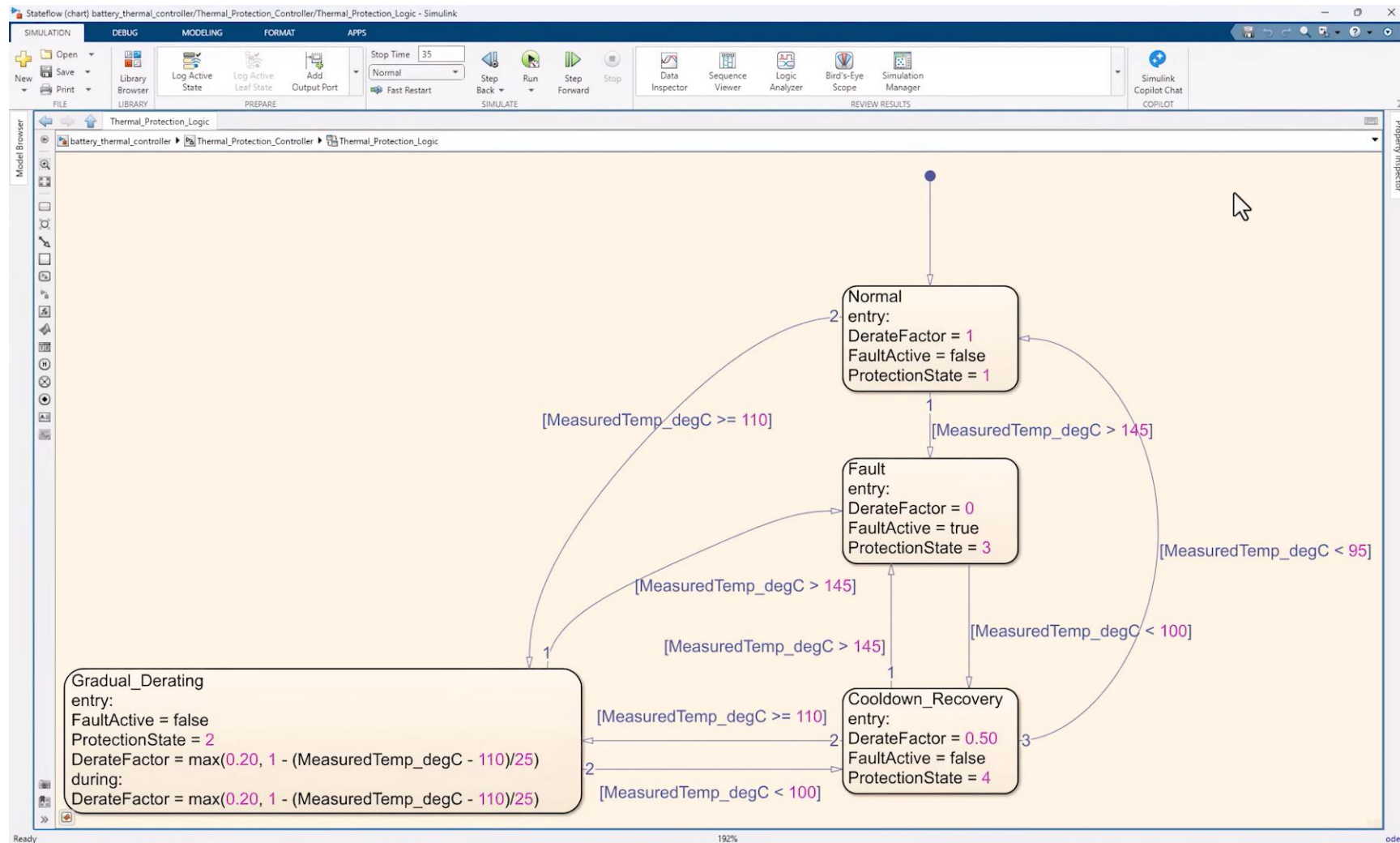
3 · GENERATED CODE

```
/* Thermal_Protection chart */
if (MeasuredTemp degC > 145.0F) {
  /* Transition: '<S5>:10':
   * 1. BAT-TP-005
   */
  ProtectionState = 3U;
  DerateFactor    = 0.0F;
  FaultActive     = true;
}
```

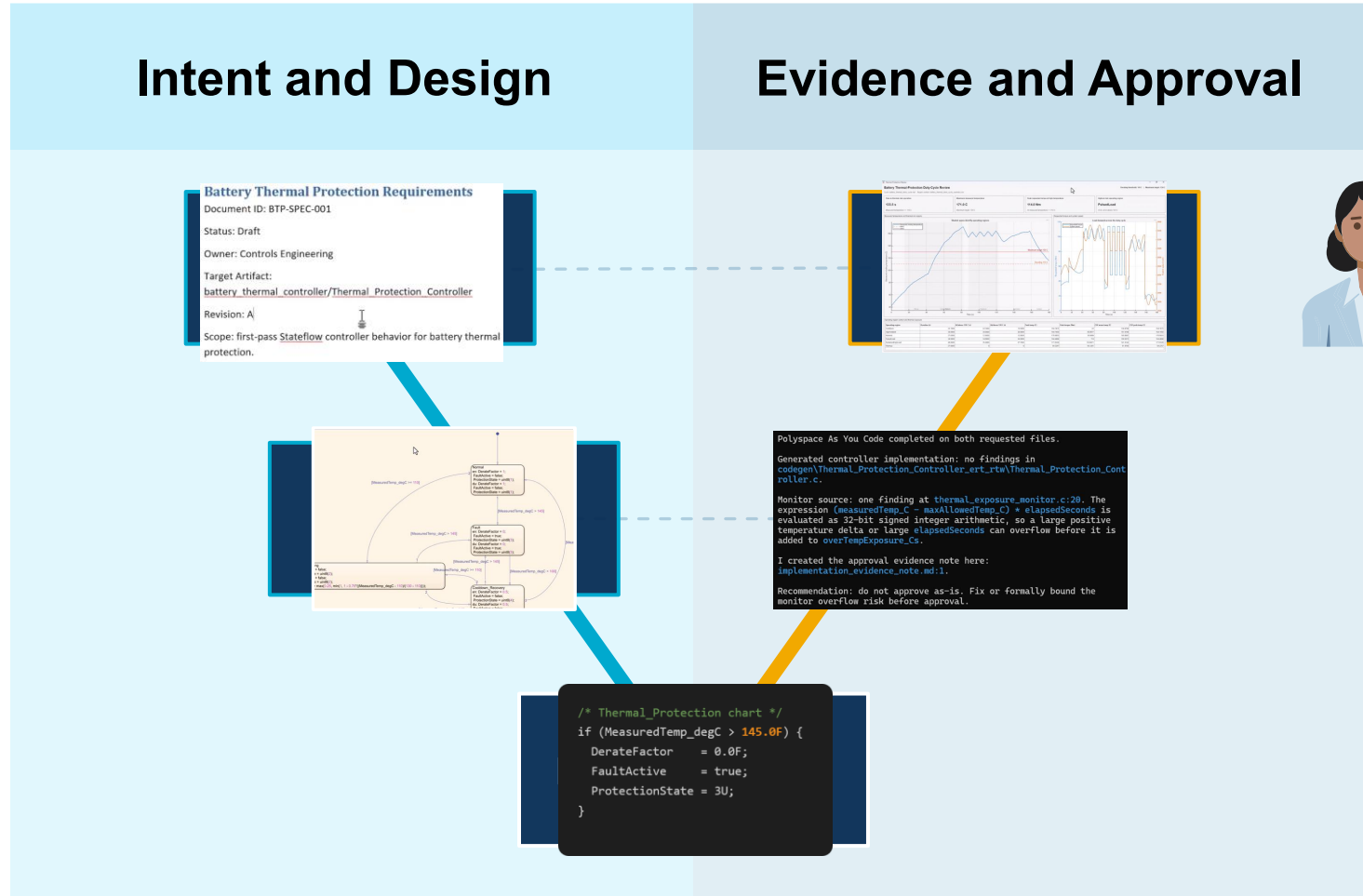
Build the evidence for approval



Verification catches what plausibility misses



Authorship can change; evidence informs the decisions



Agentic Model-Based Design in practice

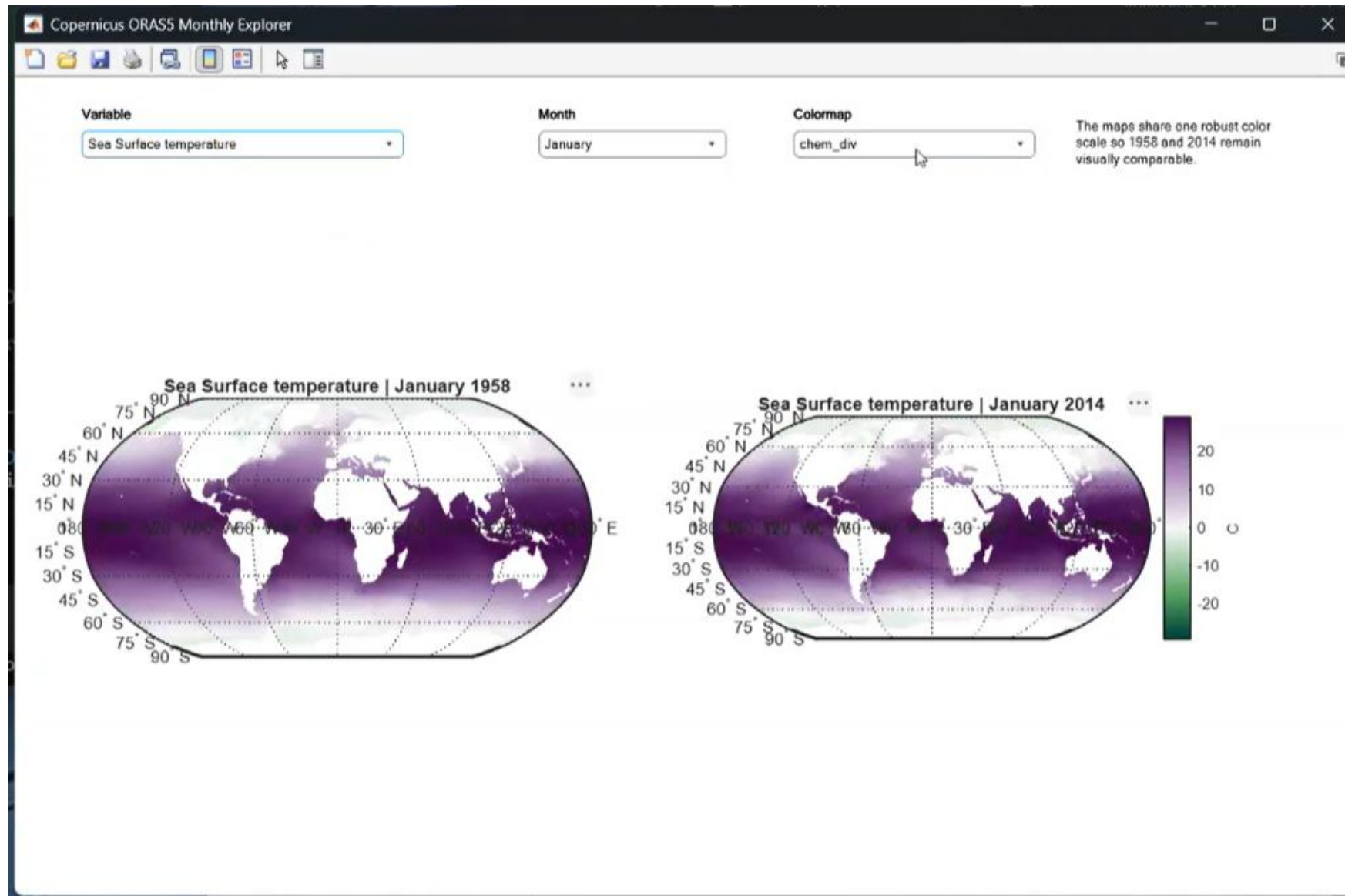
AUMOVIO is applying agentic model-based development in project environments using MATLAB and Simulink technologies from MathWorks to accelerate model-based embedded software development while maintaining quality and consistency.

The approach supports our engineers in managing the growing complexity of modern automotive systems.

AUMOVIO

Accelerating Research with Agentic AI

Build your own apps for visualizing climate data with Agentic AI



Challenges using agentic AI for research

- Hard to keep track when both you & the agent are making changes to code
 - Solution: use version control



- Errors in MATLAB code can be harder to find when not hand-written
 - Solution: create and use automated tests

MATLAB® Test Report

Timestamp: 09-Feb-2024 10:54:02
Host: AH-DHRUSKA
Platform: win64
MATLAB Version: 24.2.0.2510308 (R2024b) Prerelease
Number of Tests: 4
Testing Time: 0.6628 seconds
Overall Result: FAILED



Reproducible Research Workflow

Problem Definition

- Brainstorm ideas
- Literature search

Computational Experiments

- Develop algorithms
- Run simulations

Validate Software

- Code analysis
- Testing

Theory Development

- Formulate hypotheses
- Explore ideas
- Sketch proofs

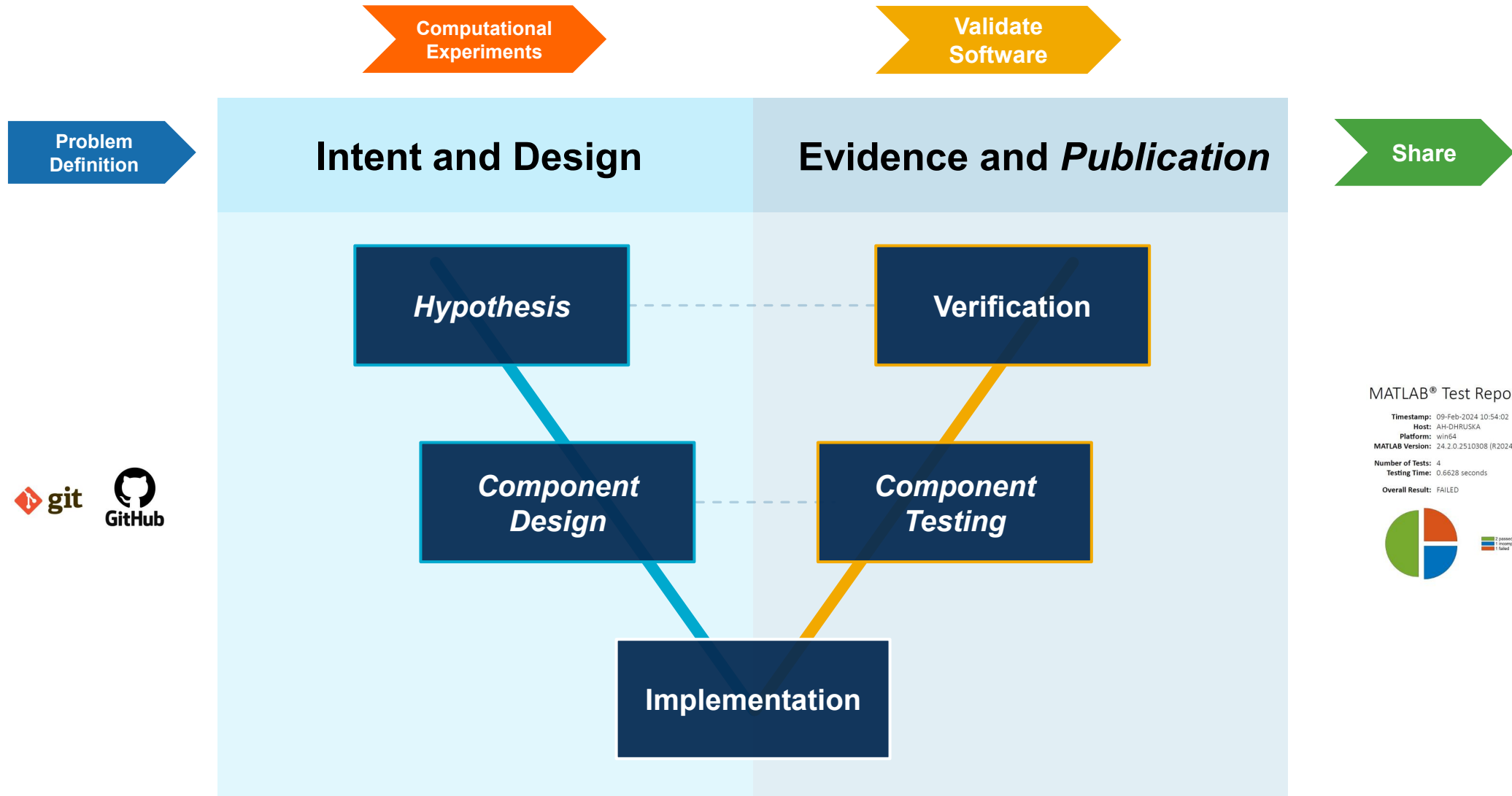
Verification & Proof

- Peer review
- Formal proof assistance

Share

- Reproducible research

The evidence map for reproducible research



MATLAB® Test Report

Timestamp: 09-Feb-2024 10:54:02
 Host: AH-DHRUSKA
 Platform: win64
 MATLAB Version: 24.2.0.2510308 (R2024b) Prerelease
 Number of Tests: 4
 Testing Time: 0.6628 seconds
 Overall Result: FAILED



My computational experiments need an evidence path too

$$\|f - s\|_{L_\infty} \leq Ch^\alpha \|f\|_{\varphi * \varphi}$$

Computational
Experiments

Validate
Software

Problem
Definition

Intent and Design

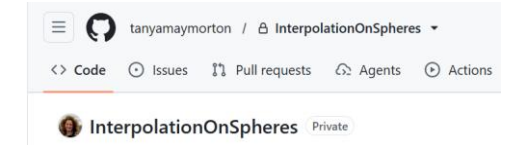
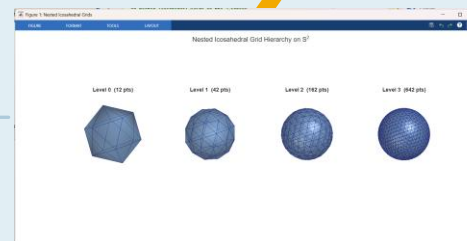
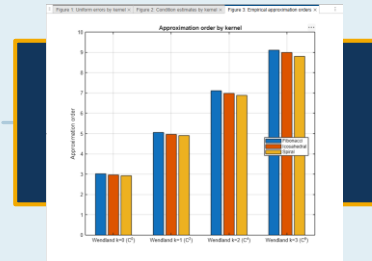
Evidence and Publication

Share

When $k = 0$
Approximation order $\alpha = 3$

Components:
Generate Mesh, Define Target(f),
Select Kernel(φ), Solve, Compute
Error, Visualize

```
% solve A * x = b
x = A \ b
```



MATLAB® Test Report

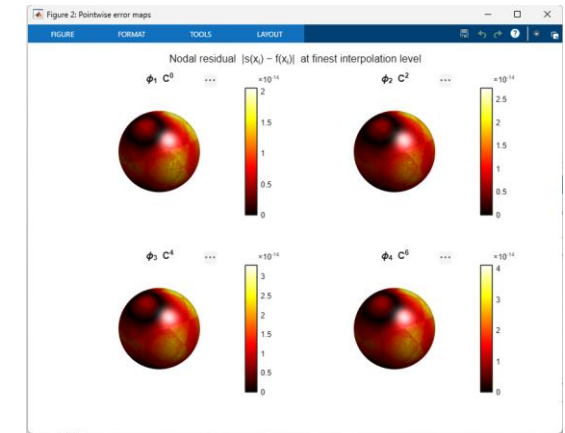
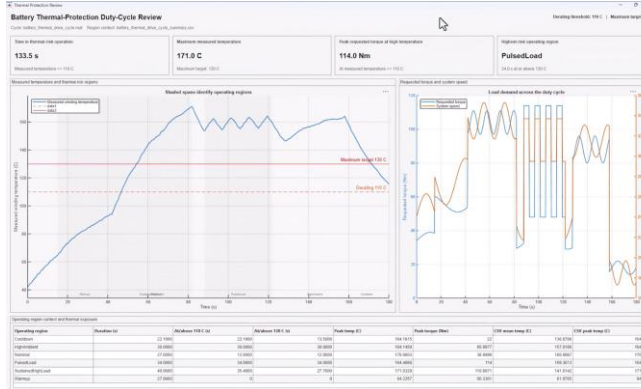
Timestamp: 09-Feb-2024 10:54:02
Host: AH-DHRUSKA
Platform: win64
MATLAB Version: 24.2.0.2510308 (R2024b) Prerelease
Number of Tests: 4
Testing Time: 0.6628 seconds
Overall Result: FAILED



AI can accelerate creation. But trustworthy outcomes require evidenced workflows.

Bring proven tools to your evidenced workflows

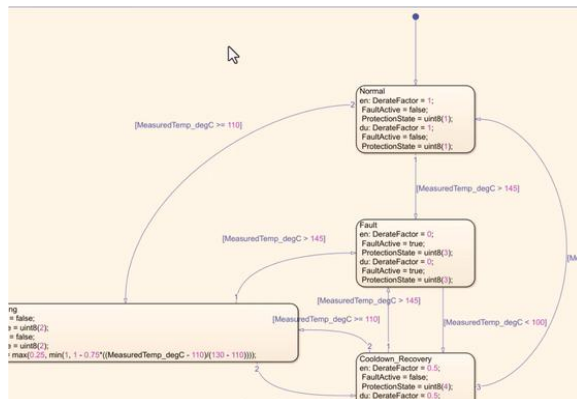
Index	ID	Summary	Implemented	Verified
DOORS_on_req	0000056	References to DOORS_on_req_func_spec		
Import				
1	CC-REQ-1	Driver Switch Request Handling		
1.1	CC-REQ-2	Switch precedence		
1.2	CC-REQ-3	Avoid repeating commands		
1.3	CC-REQ-4	Long Switch recognition		
1.4	CC-REQ-5	Waiting states for Long Increment switch det...		
1.5	CC-REQ-6	Waiting states for Long Decrement switch de...		
1.6	CC-REQ-7	Cancel Switch Detection		
1.7	CC-REQ-8	Set Switch Decision		
1.8	CC-REQ-9	Enable Switch Detection		
1.9	CC-REQ-10	Resume Switch Detection		
1.10	CC-REQ-11	Increment Switch Detection		
1.11	CC-REQ-12	Increment Short Switch Detection		
1.12	CC-REQ-13	Increment Long Switch Detection		
1.13	CC-REQ-14	Intermediate state		
1.14	CC-REQ-15	Decrement Switch Detection		
1.15	CC-REQ-16	Decrement Short Switch Detection		
1.16	CC-REQ-17	Decrement Long Switch Detection		
1.17	CC-REQ-18	Intermediate state		
2	CC-REQ-19	Crash Control Mode		
3	CC-REQ-20	Calculate Torque Speed and Throttle Value		



Requirements and traceability

Apps & Toolboxes

Visualization



Polyspace As You Code completed on both requested files.

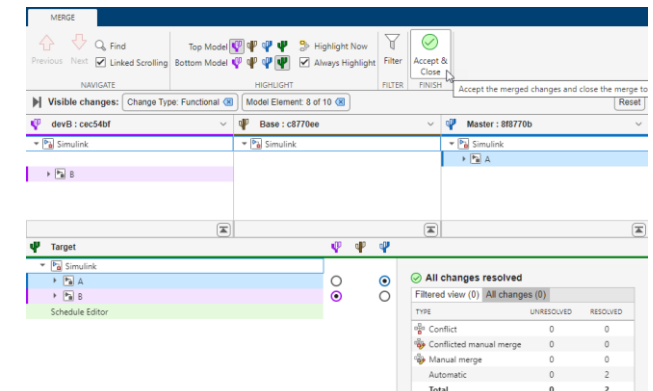
Generated controller implementation: no findings in `codegen\Thermal_Protection_Controller_ert_rtw\Thermal_Protection_Controller.c`.

Monitor source: one finding at `thermal_exposure_monitor.c:20`. The expression `(measuredTemp_C - maxAllowedTemp_C) * elapsedSeconds` is evaluated as 32-bit signed integer arithmetic, so a large positive temperature delta or large `elapsedSeconds` can overflow before it is added to `overTempExposure_Cs`.

I created the approval evidence note here: `implementation_evidence_note.md:1`.

Recommendation: do not approve as-is. Fix or formally bound the monitor overflow risk before approval.

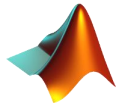
Verification



Version control, CI, Test

Stateflow

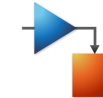
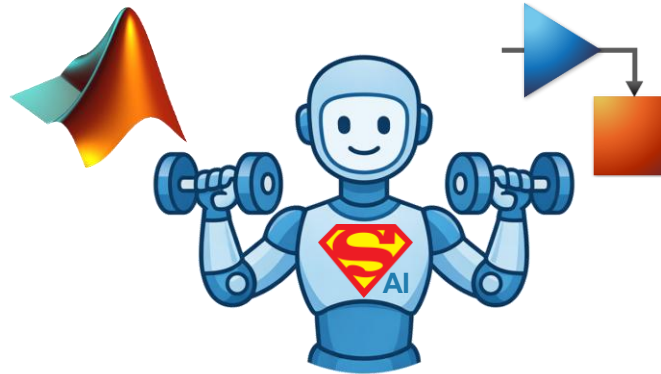
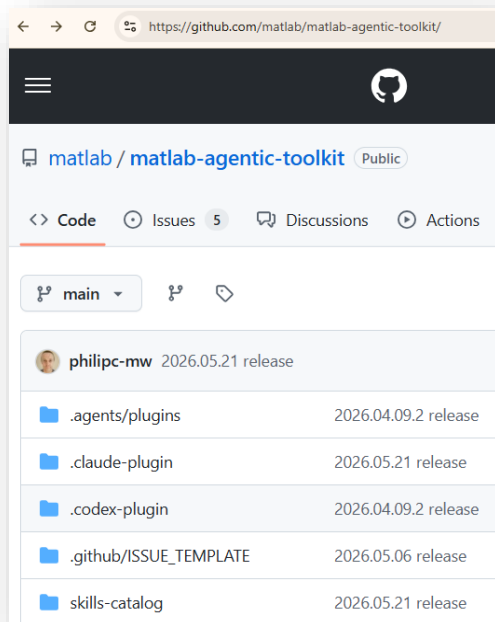
MATLAB Agentic Toolkit & Simulink Agentic Toolkit



MATLAB Agentic Toolkit

Core Capabilities

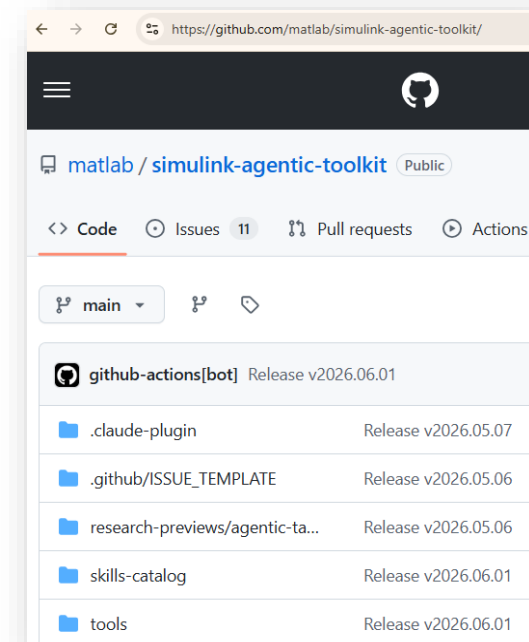
- Live MATLAB execution
- Expert skill catalog
- Multi-platform support



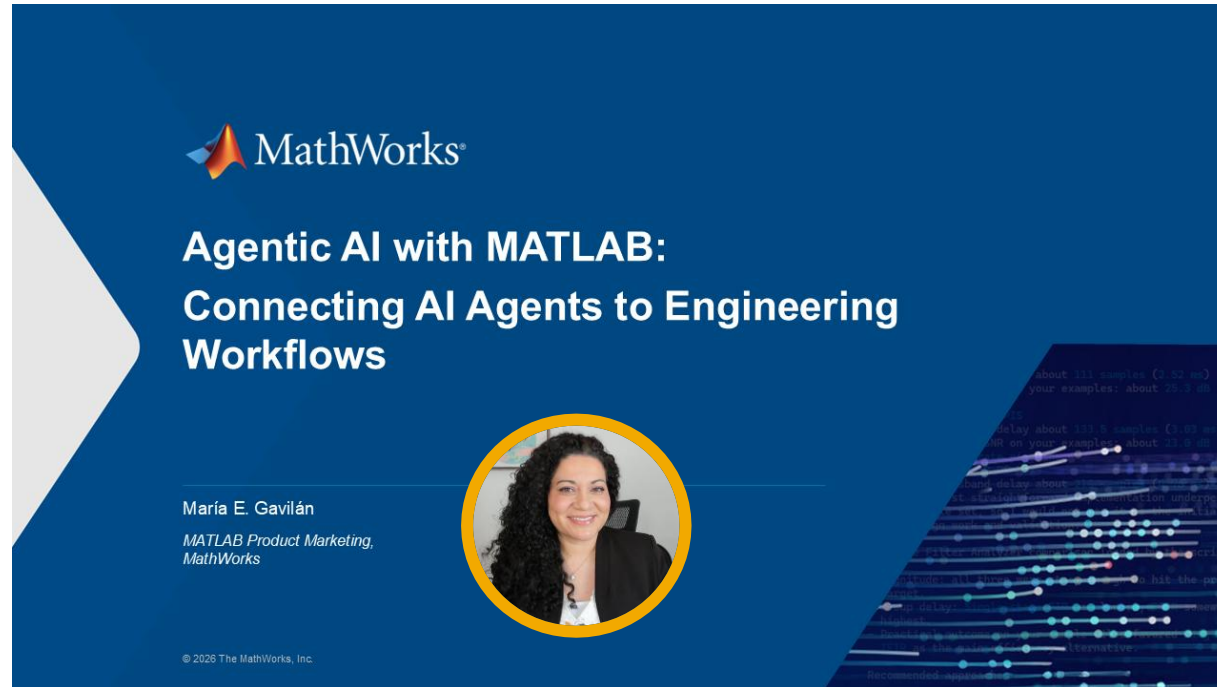
Simulink Agentic Toolkit

Core Capabilities

- Simulink-optimized MCP tools + skill catalog
- Model understanding & verification
- Multi-platform support



Join this upcoming webinar and learn more about Agentic AI in Engineering Workflows



17
SEP

Multiple Demos

Live Q&A



SCAN ME

**Speed comes from the agent.
Trust comes from the workflow.**