MATLAB EXPO FRANCE

8 octobre 2024 | Paris

Usine logicielle, industrialisez vos développements avec MATLAB et Simulink

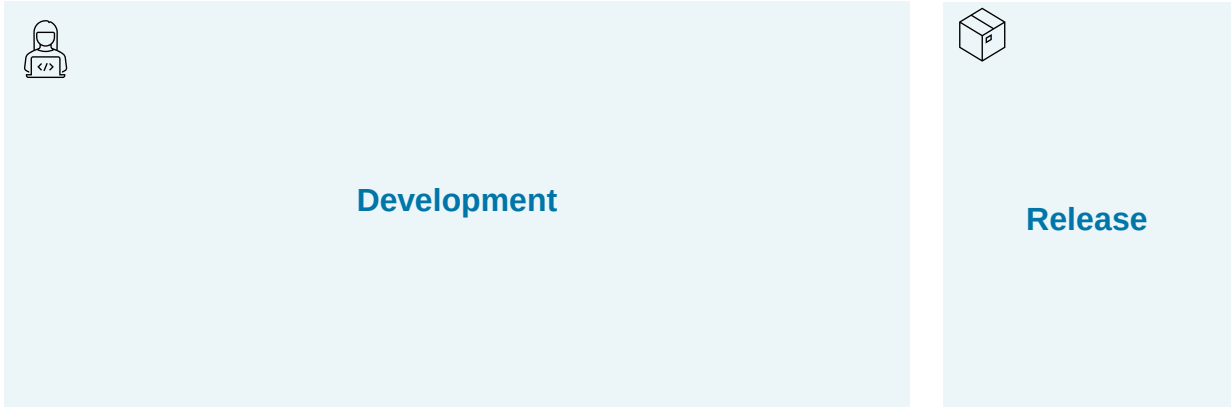
Michelle Valente, MathWorks

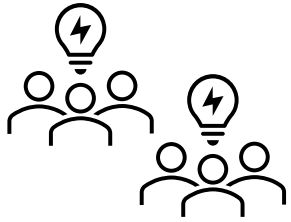
Maxime François, MathWorks

MathWorks

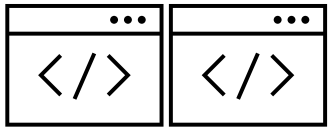
Traditional Software Development

Challenges Without a Software Factory





Fragmented Processes

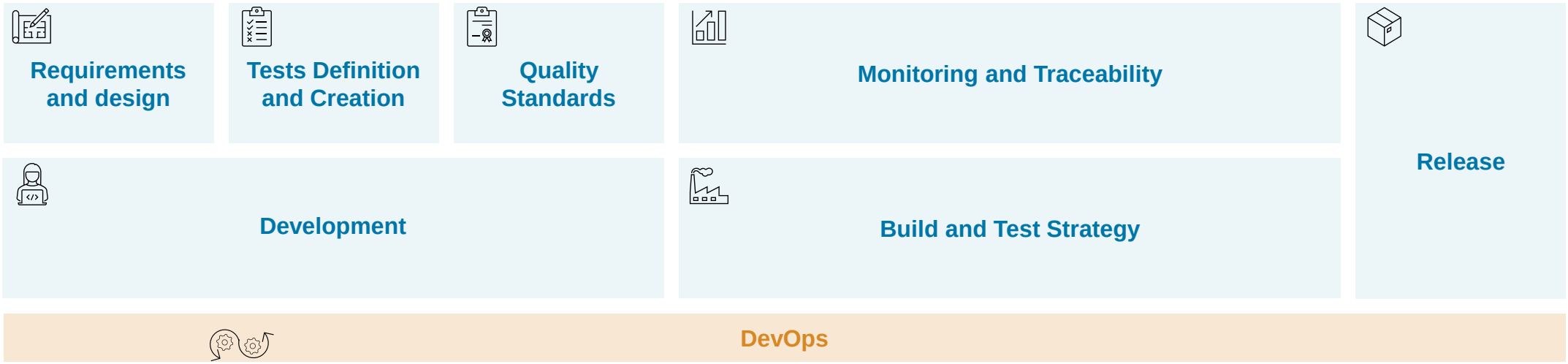


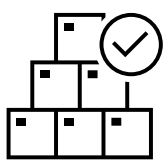
Limited Reusability

Higher Error Risk

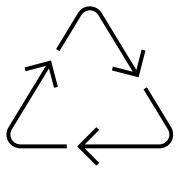
Software Factory

An approach to create software applications based on manufacturing principles





Standardization



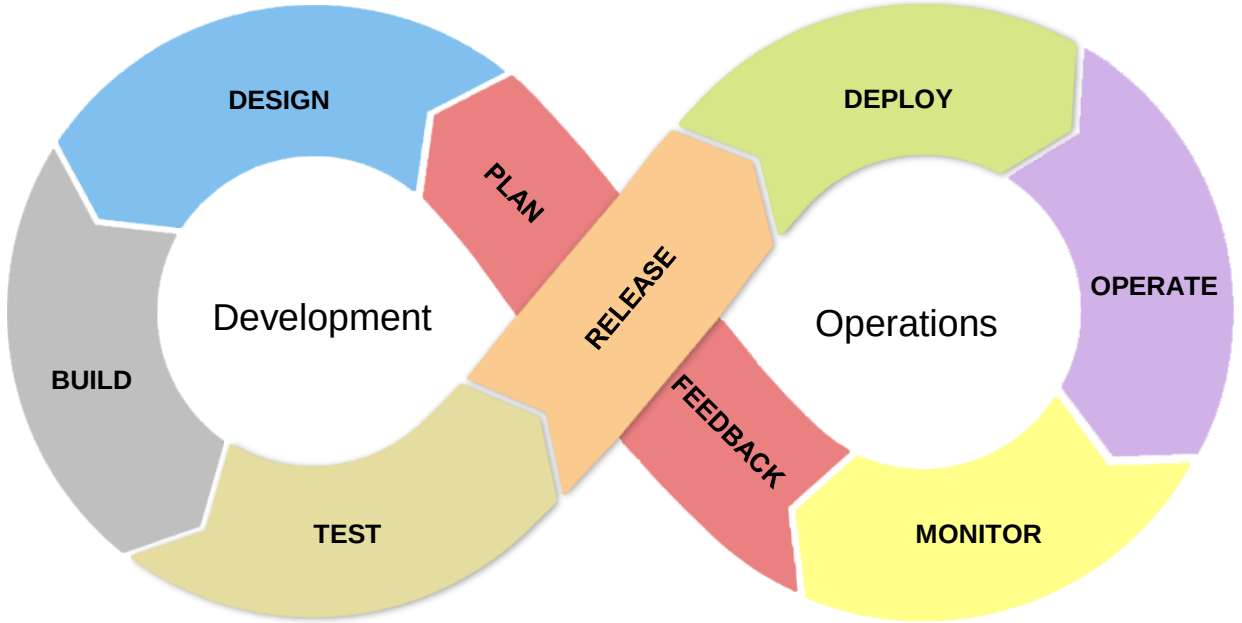
Reusability

Quality

What is DevOps?

Unifying development and operations with continuous collaboration and automation

Collaboration



Monitoring and Feedback

Automation

Continuous Integration

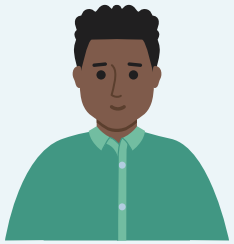
Continuous Deployment

Project Context

Advanced Air Mobility: The future of air transportation

Reference project: startup developing drones for air mobility systems

Project team

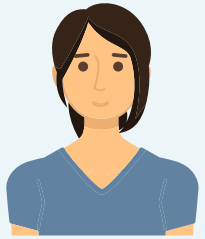


Project Manager

Oversees project scope and timeline

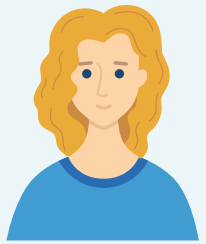
DevOps Engineer

Manages CI/CD and automation



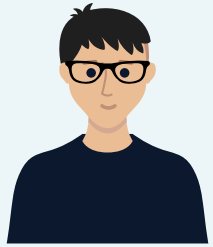
Phys Mod Engineer

Develops drone models and simulations



Control Engineer

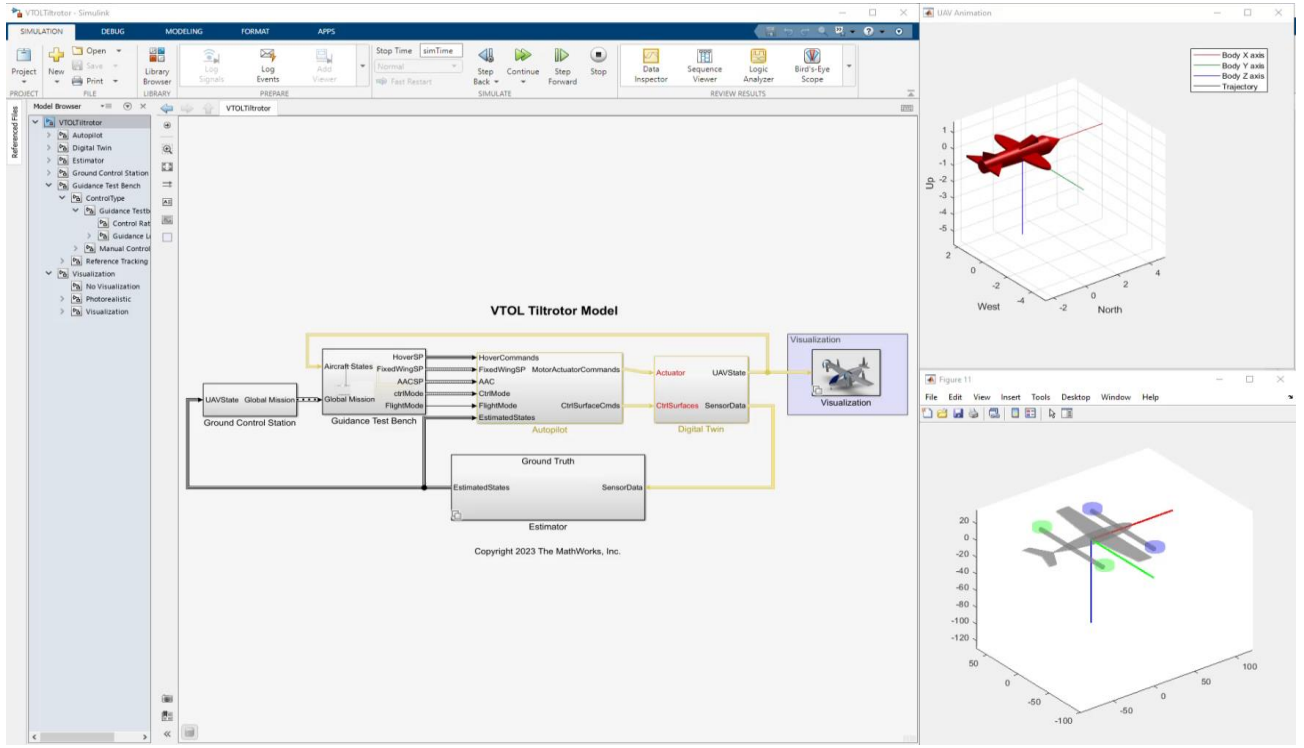
Designs and tunes controllers



Test Engineer

Validates system performance

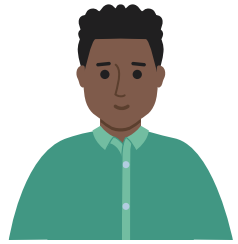
Current Project Status



Release V1.0 delivered to customer

New Customer Request

Customer



Project Manager

To Jack Cc Bcc

Issues with attitude controller in V1.0

Hi Jack,

I hope you're well. We're experiencing issues with the attitude controller software, which currently allows a max error of 0.3 radians on our testing scenario—exceeding the 0.2 radians required by our new camera supplier. This is critical for maintaining product quality. Could we discuss solutions and a timeline for improvements at your earliest convenience? Your prompt attention to this is appreciated.

Best regards,

Tim

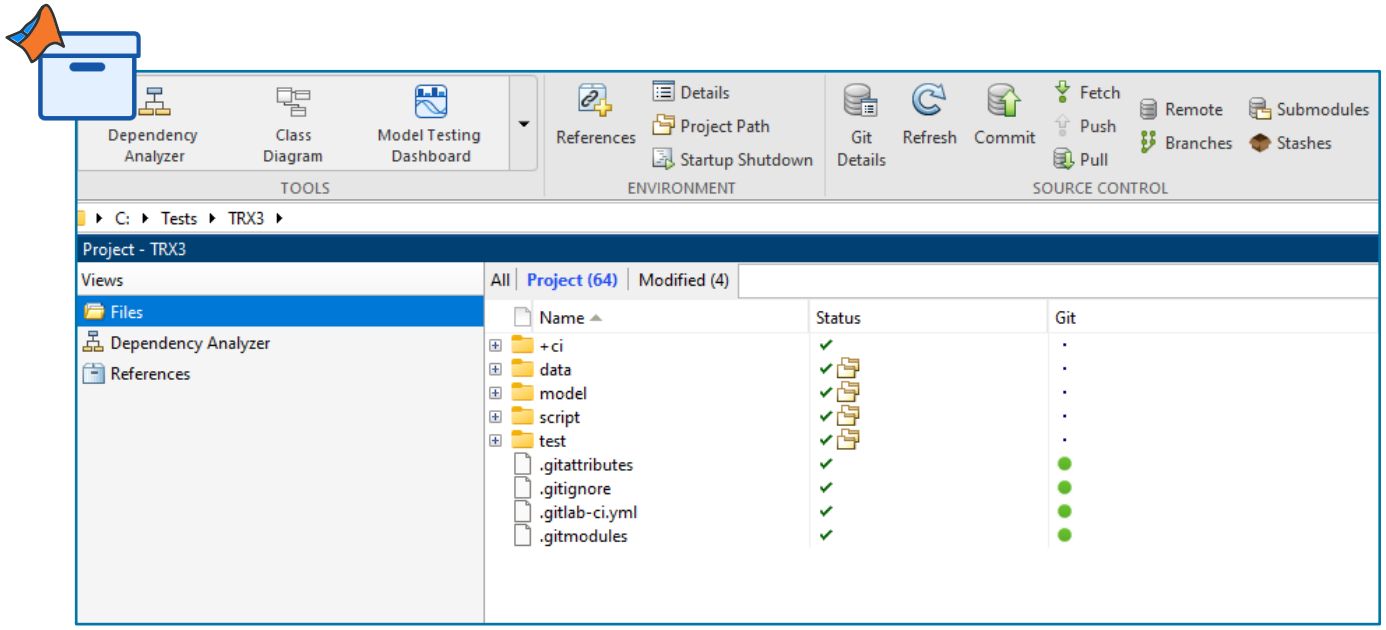
Project Content

Project specific features

Dashboards, Dependency Analysis

Path and init/shutdown

Source Control Management



Project Design

Requirements
myReq.slreqx

Model Source
myModel.slx
myData.sldd

Test
myTestFile.mldatx
myHarness.slx

Documentation
mydoc.mlx

Data
myComputationData.mlx

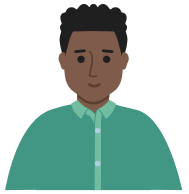
Library source
myLibrary.slx

Tools source
myTools.slx

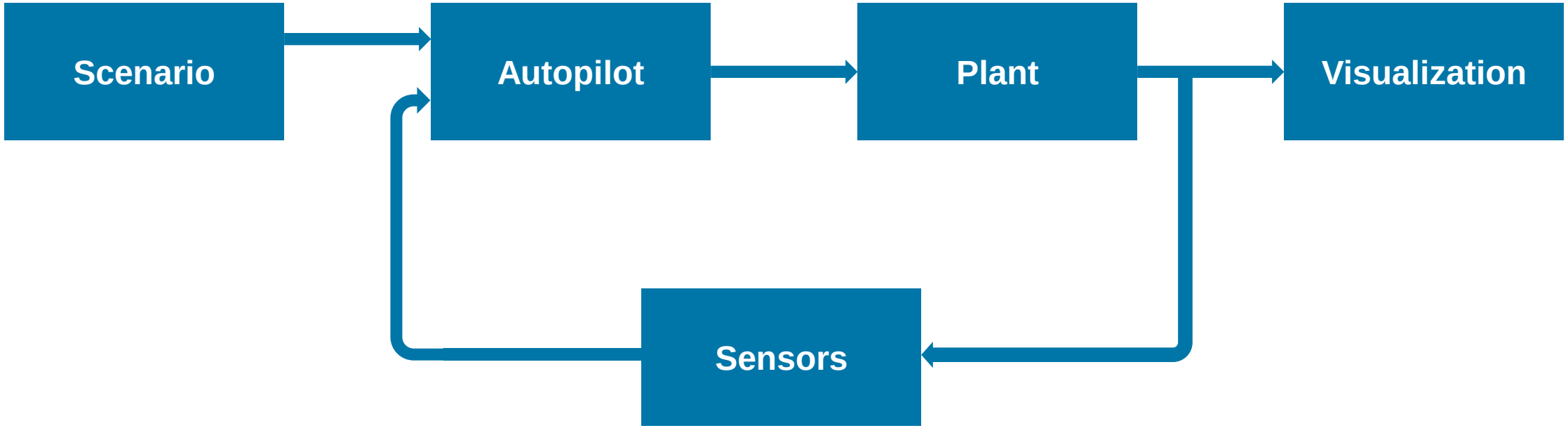
Other Source
myModel.slx
myData.sldd

- Local
- Reference
- Reference from another project

Project architecture



Project Manager



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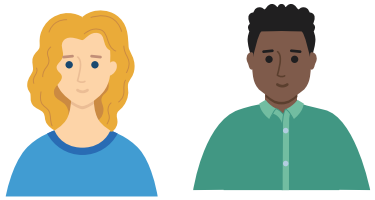

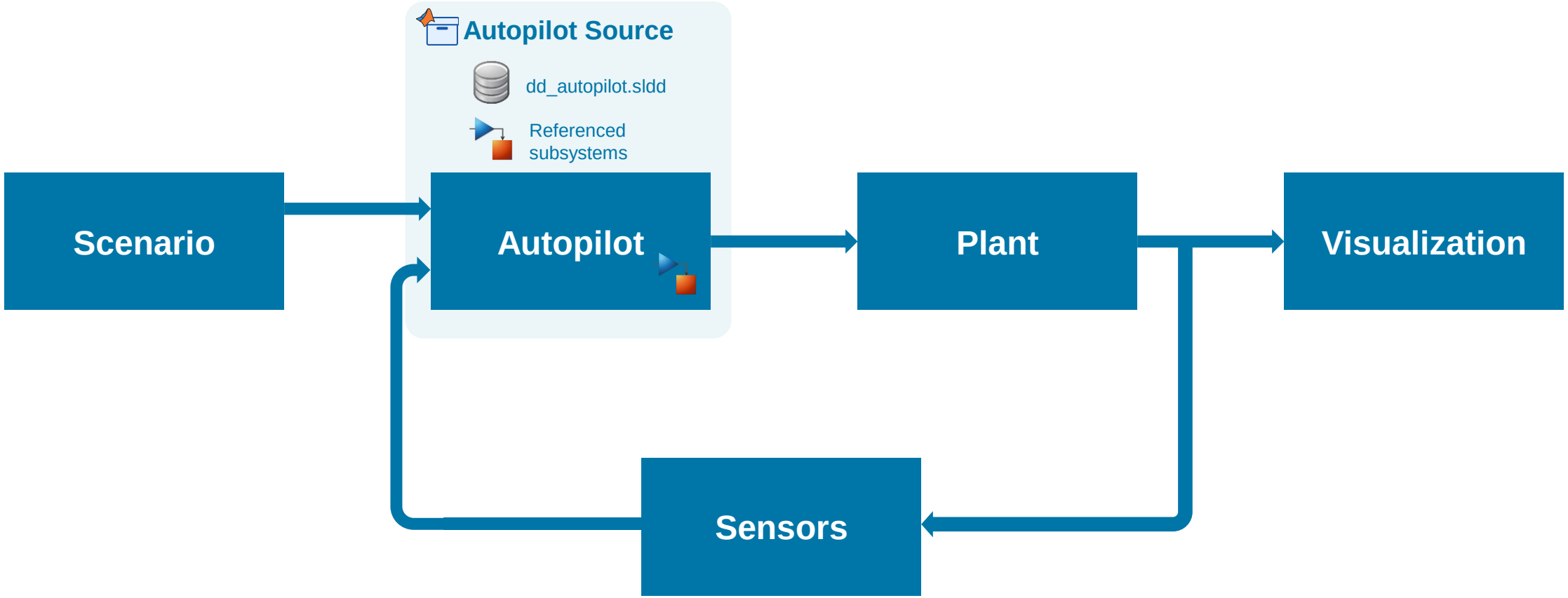

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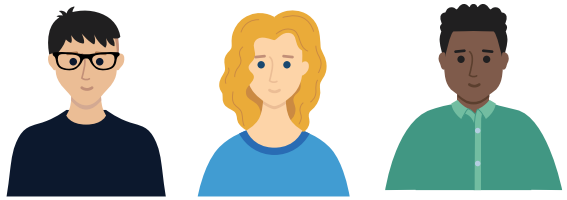

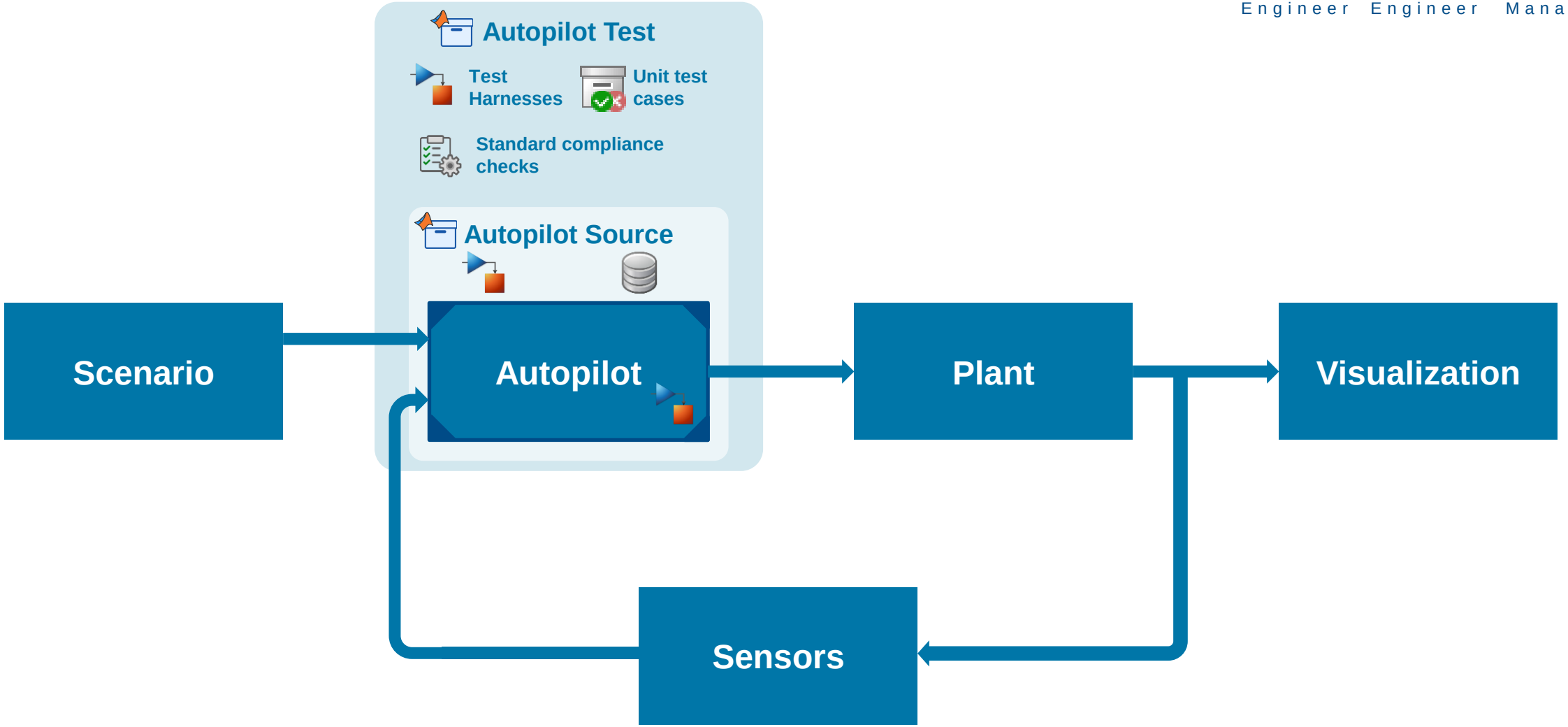

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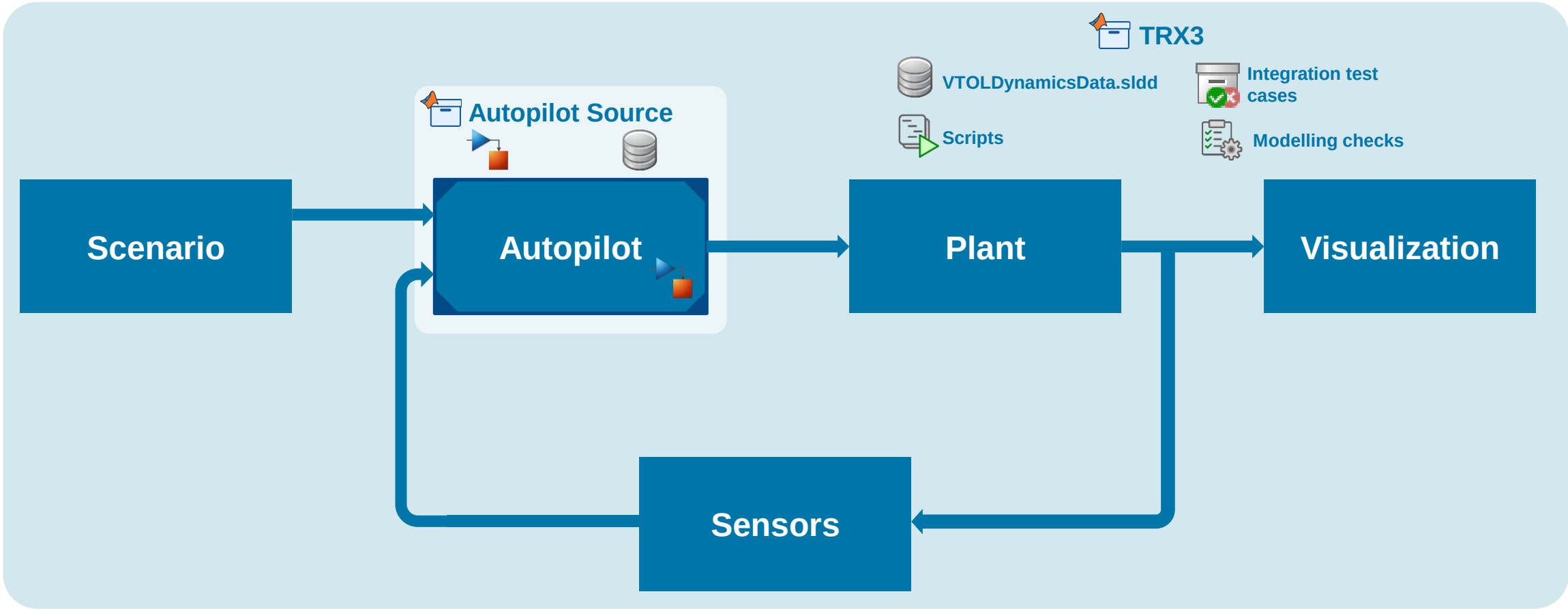
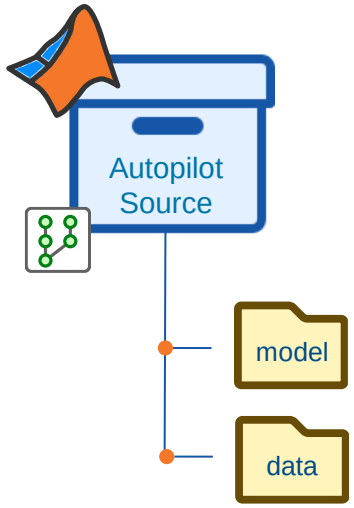
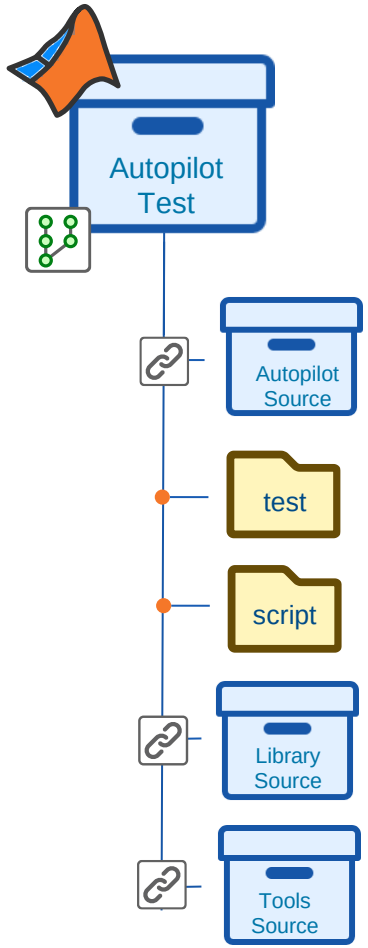


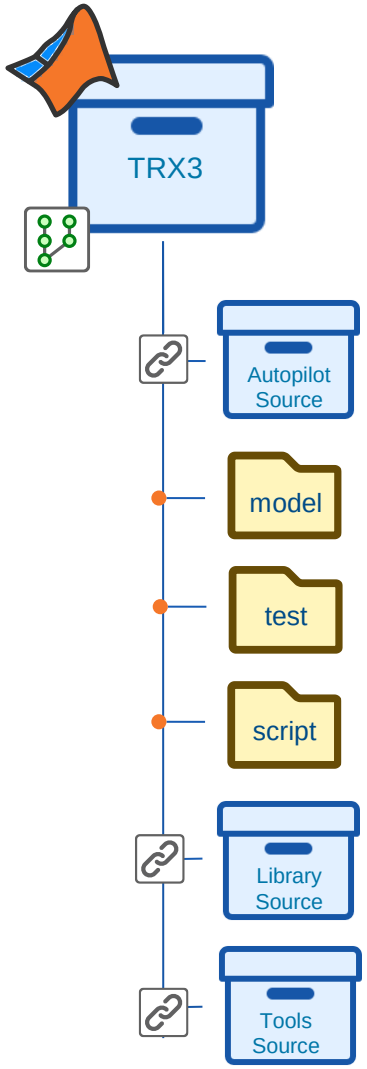
Repository Architecture

DevOps Engineer

Project Manager







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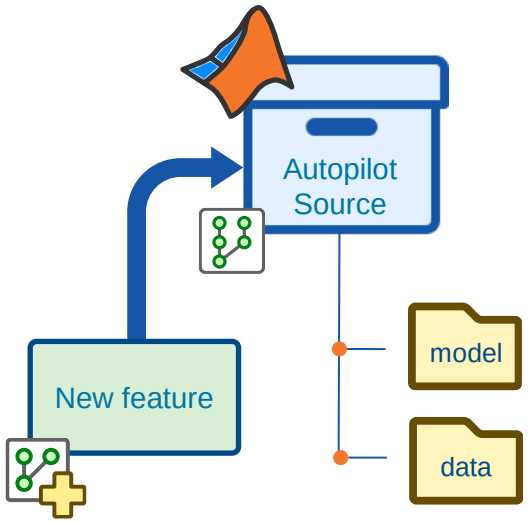
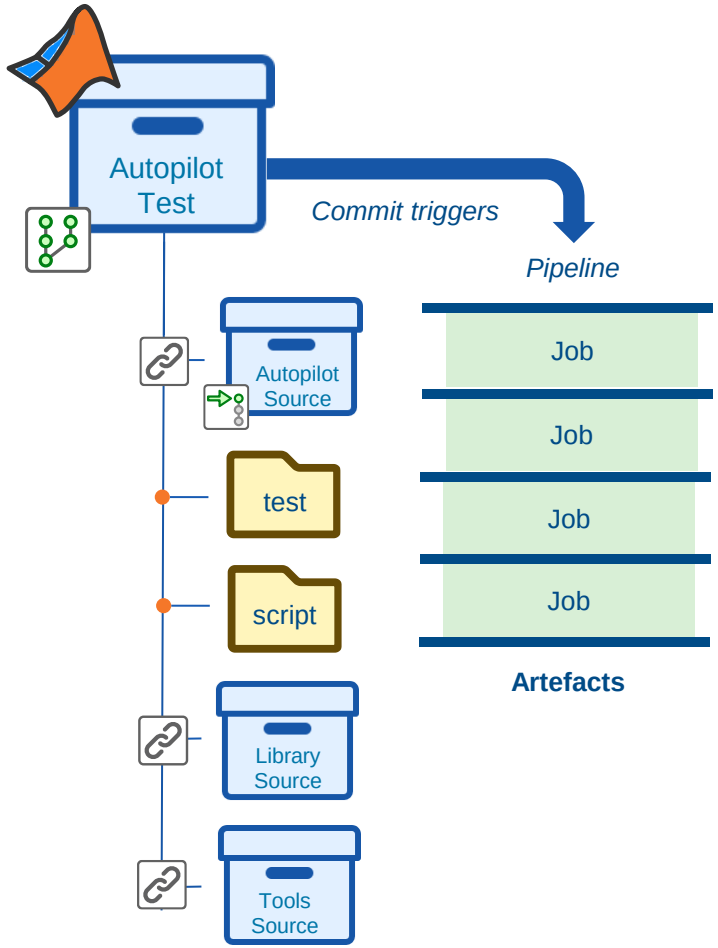
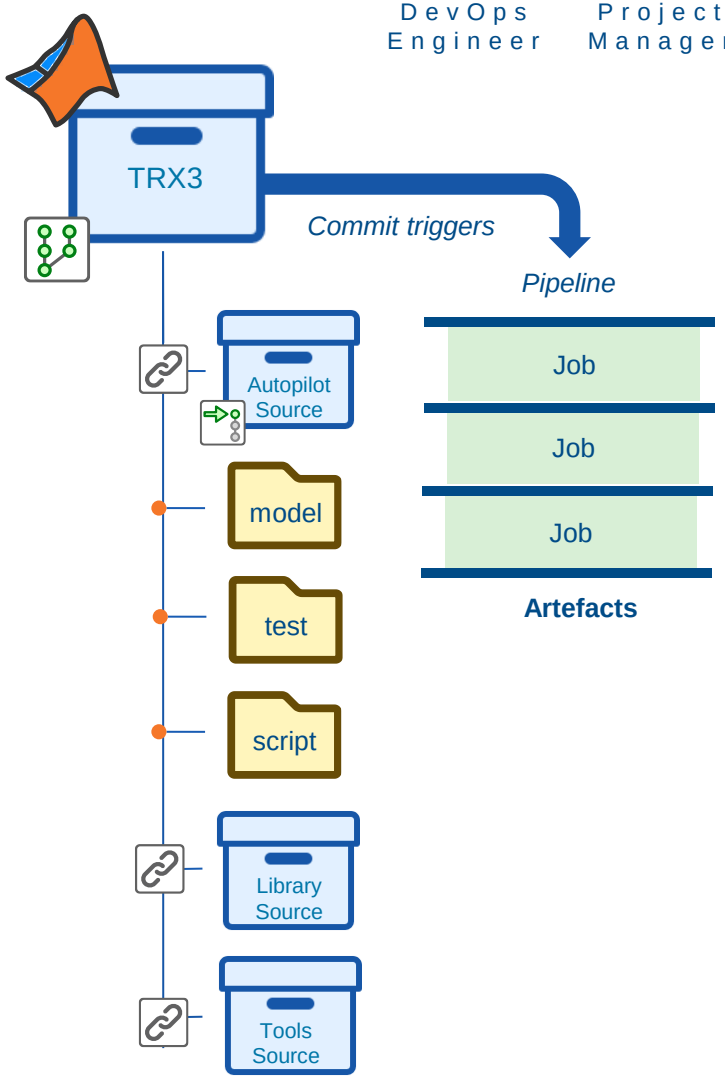
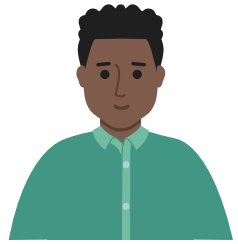






New Customer Request

Customer



Project Manager

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Best regards,

Tim

Team Meeting

[discussion] Meeting notes 11/09/2024

Edit

Open

Participants

- Project Manager
- DevOps Engineer
- Control Engineer
- Phys Mod Engineer
- Tests Engineer

Notes

- New request from customer:

  Hi Jack,

  I hope you're well. We're experiencing issues with the attitude controller software, which currently allows a max error of 0.3 radians on our testing scenario—exceeding the 0.2 radians required by our new camera supplier. This is critical for maintaining product quality. Could we discuss solutions and a timeline for improvements at your earliest convenience? Your prompt attention to this is appreciated.

  Best regards,

  Tim

- Conclusion: controller needs to be more precise on following the trajectory to achieve the prevision imposed by the camera supplier.
- We decided that we should create a variant model of the controller to address this new requirement.

Actions

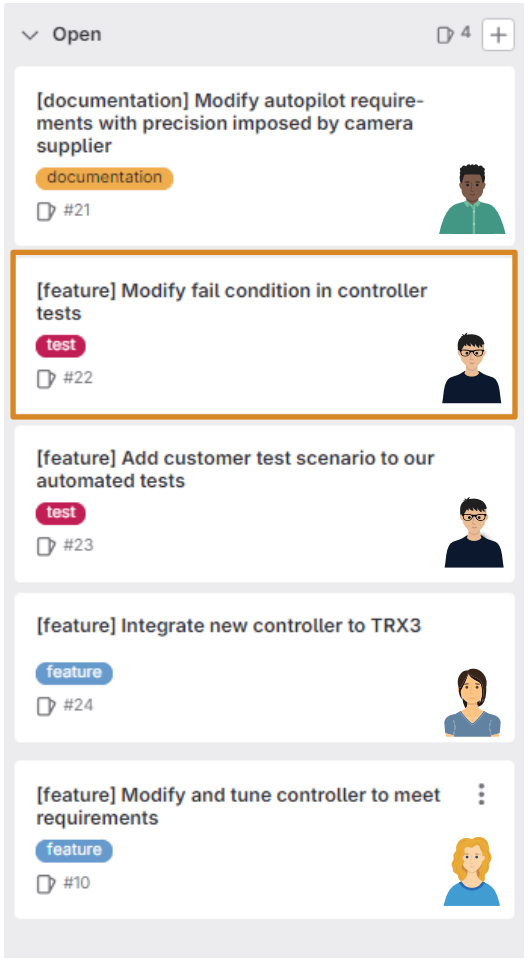
- [ ] [documentation] Modify autopilot requirements with precision imposed by camera supplier #21 (closed)
- [ ] [feature] Modify fail condition in controller tests #22
- [ ] [feature] Add customer test scenario to our automated tests #23
- [ ] [feature] Modify and tune controller to meet requirements
- [ ] [feature] Integrate new controller to TRX3 #24

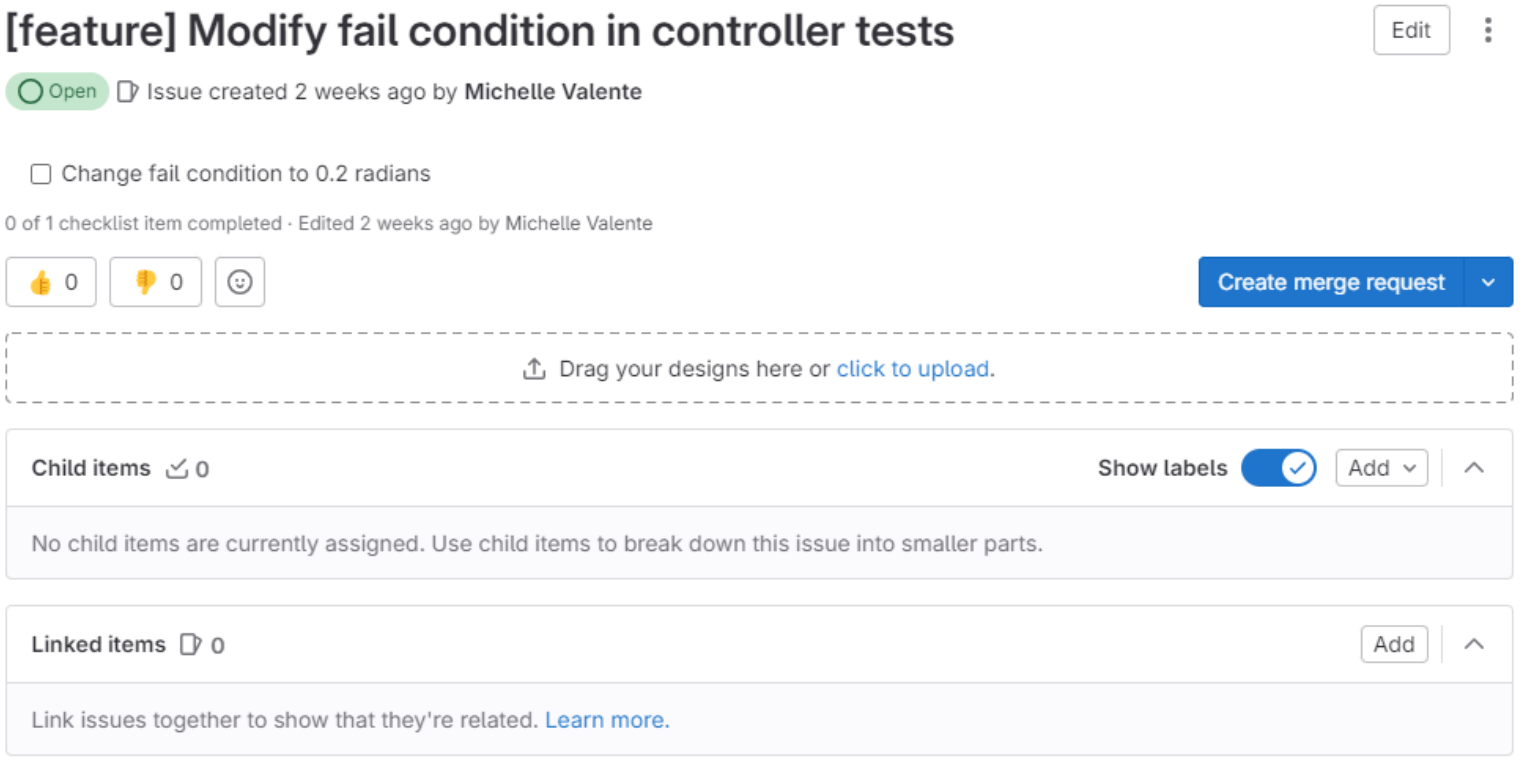
0 of 5 checklist items completed

0 0

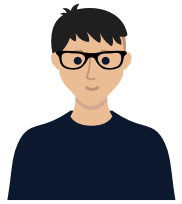
Create merge request

Issue Assignment

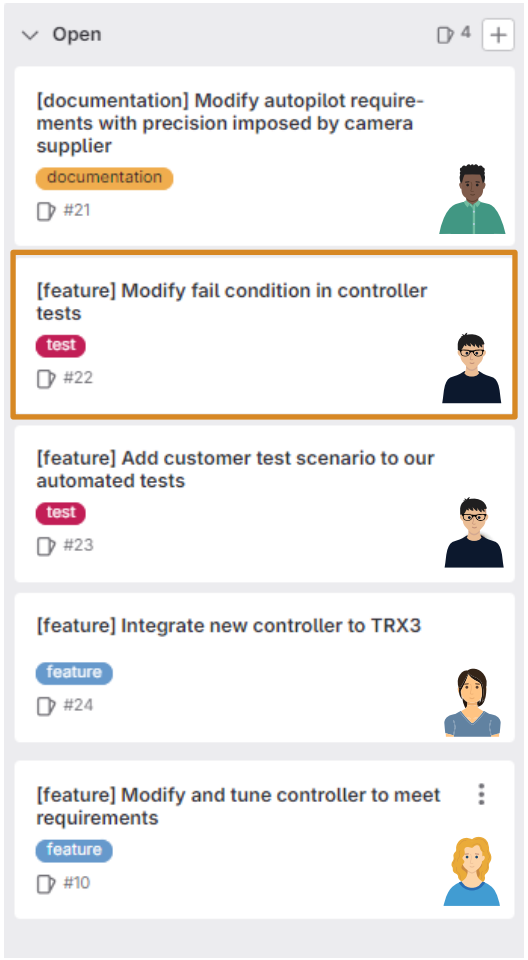


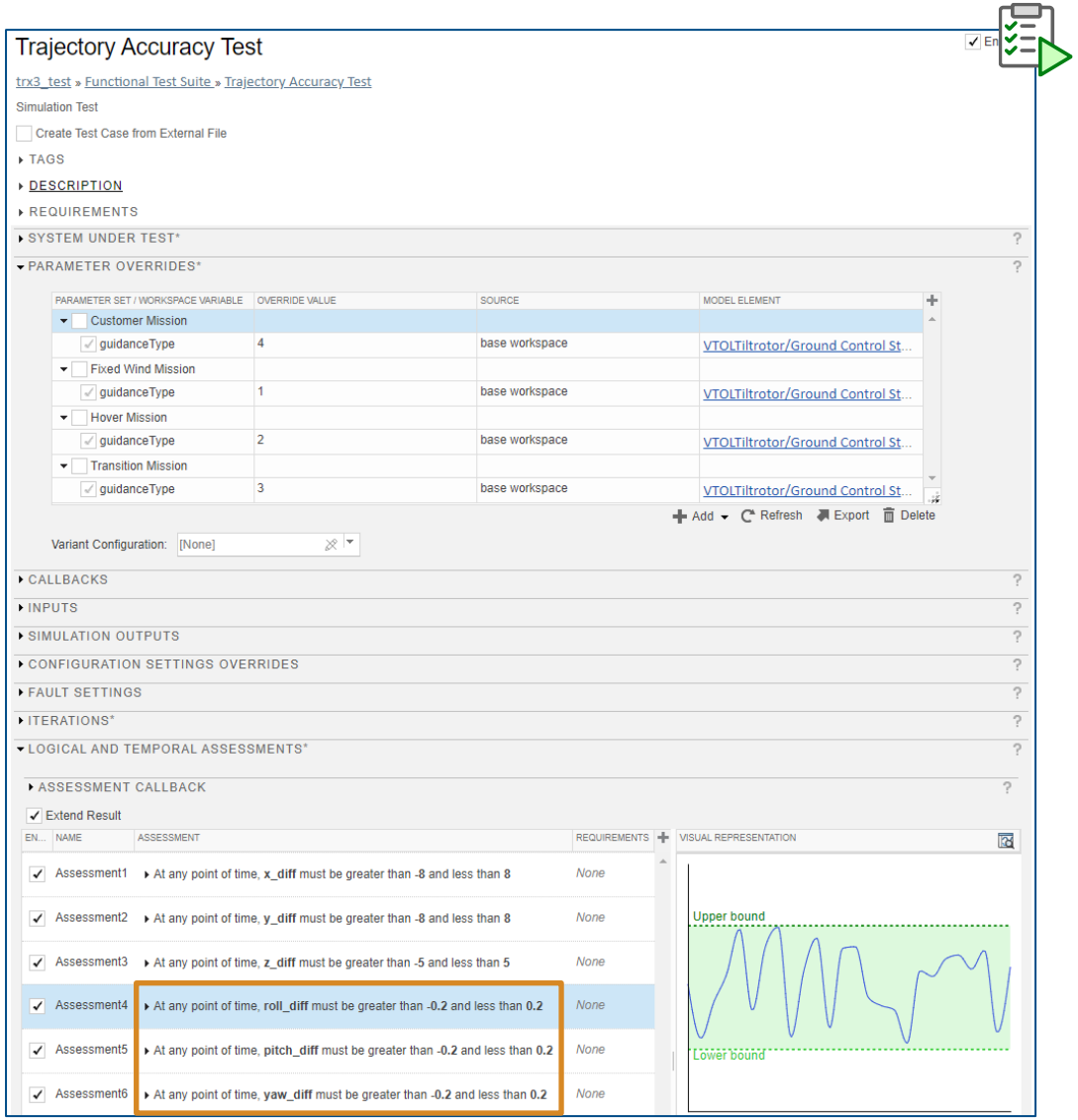


Tests Modification

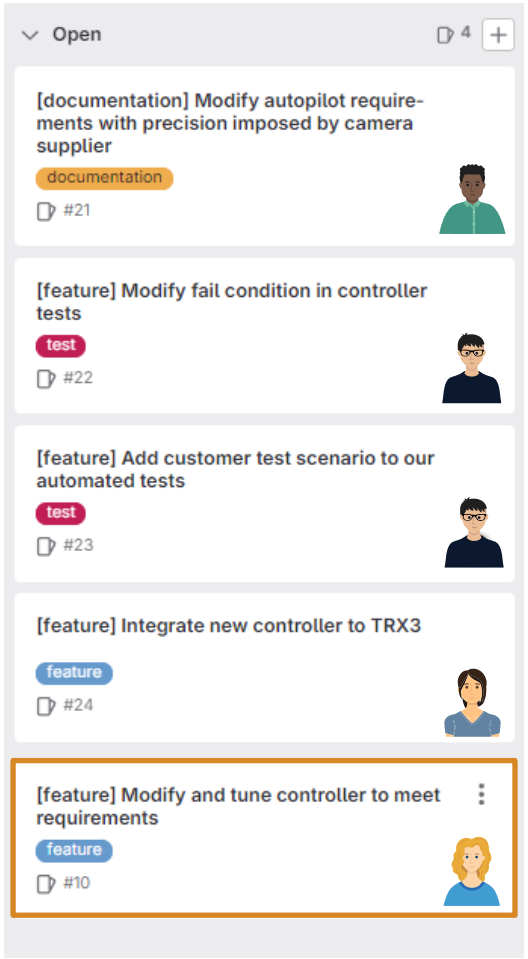


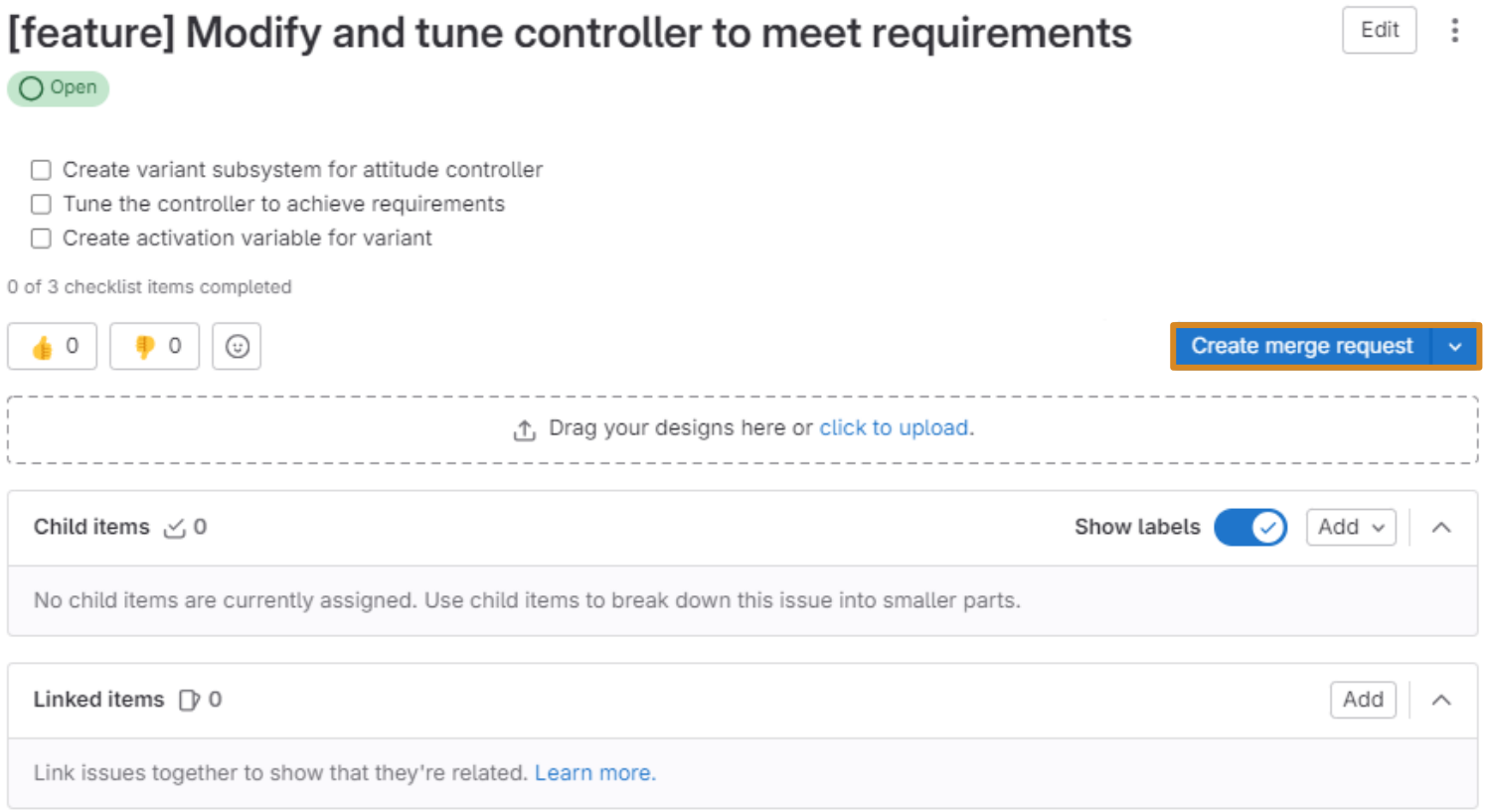
Test Engineer





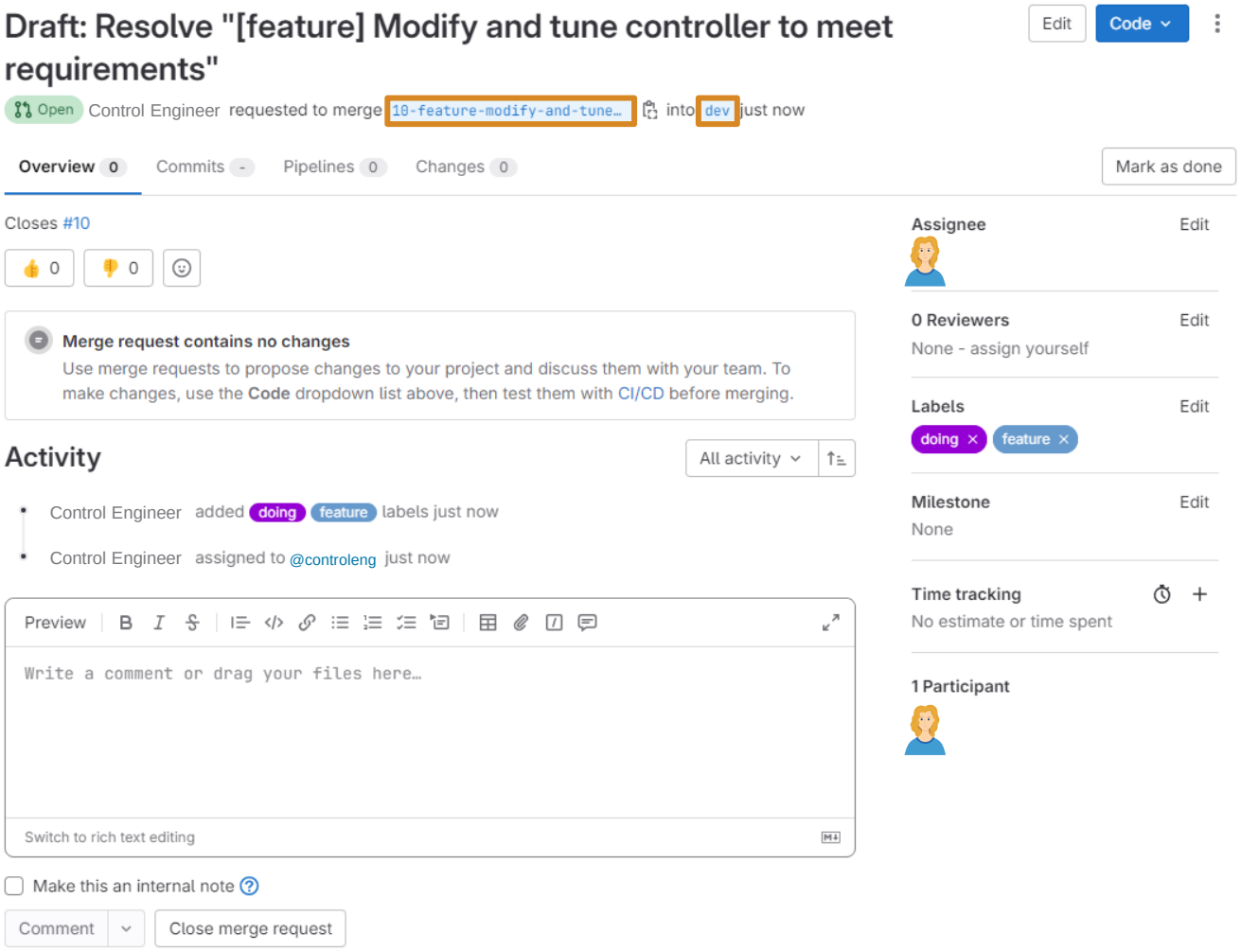
Issue Assignment





New Controller Development

Control Engineer



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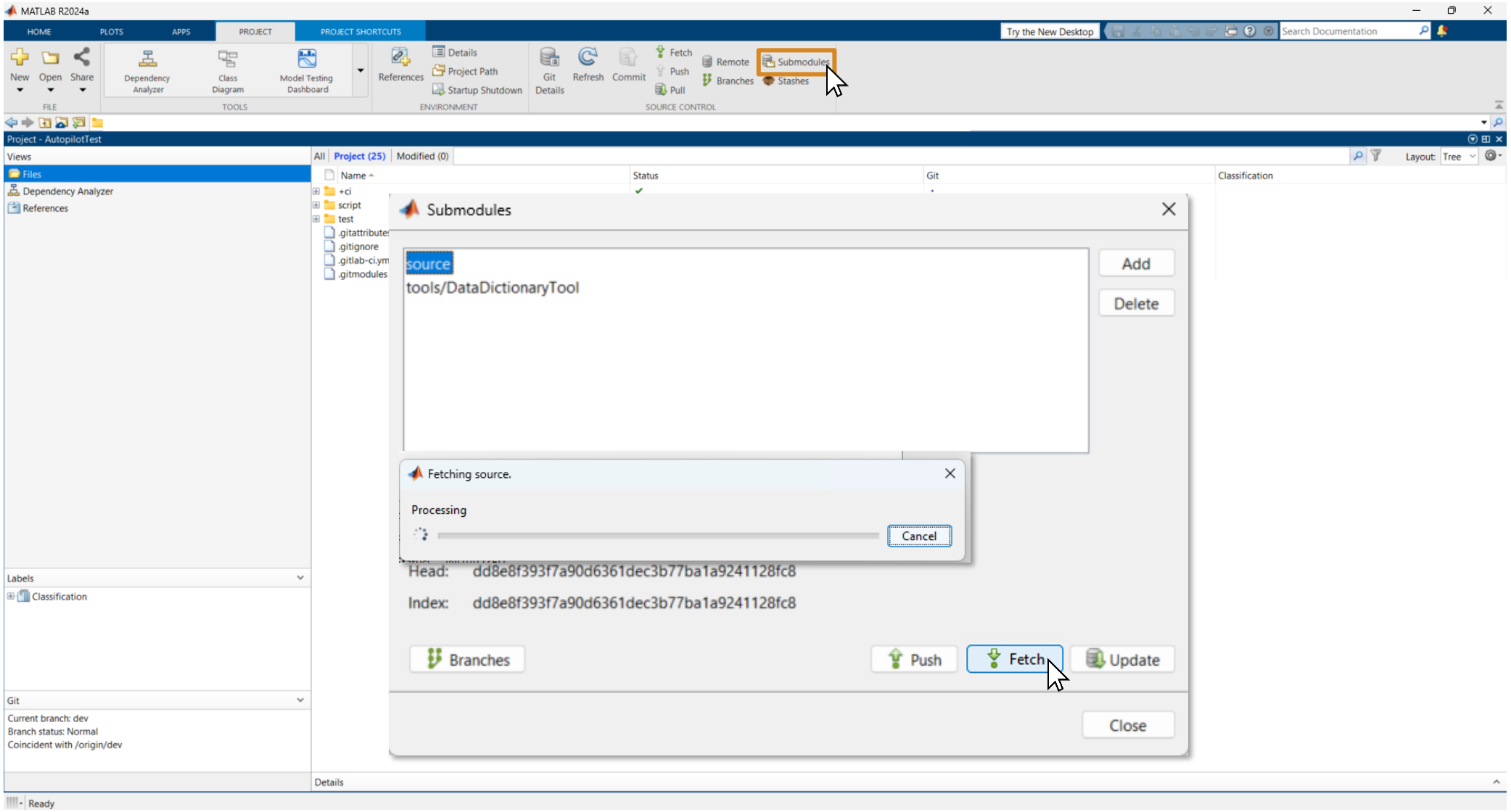

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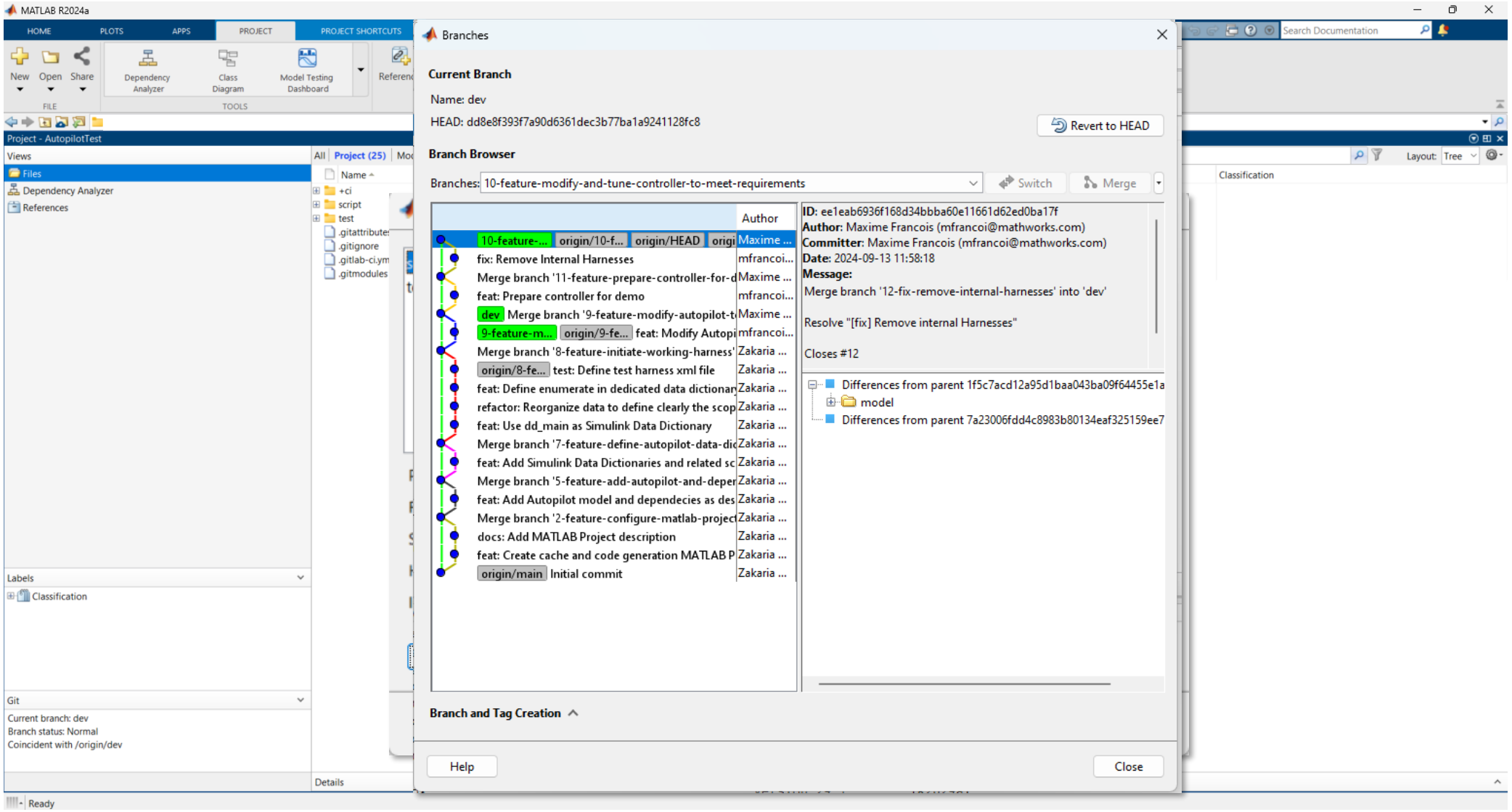

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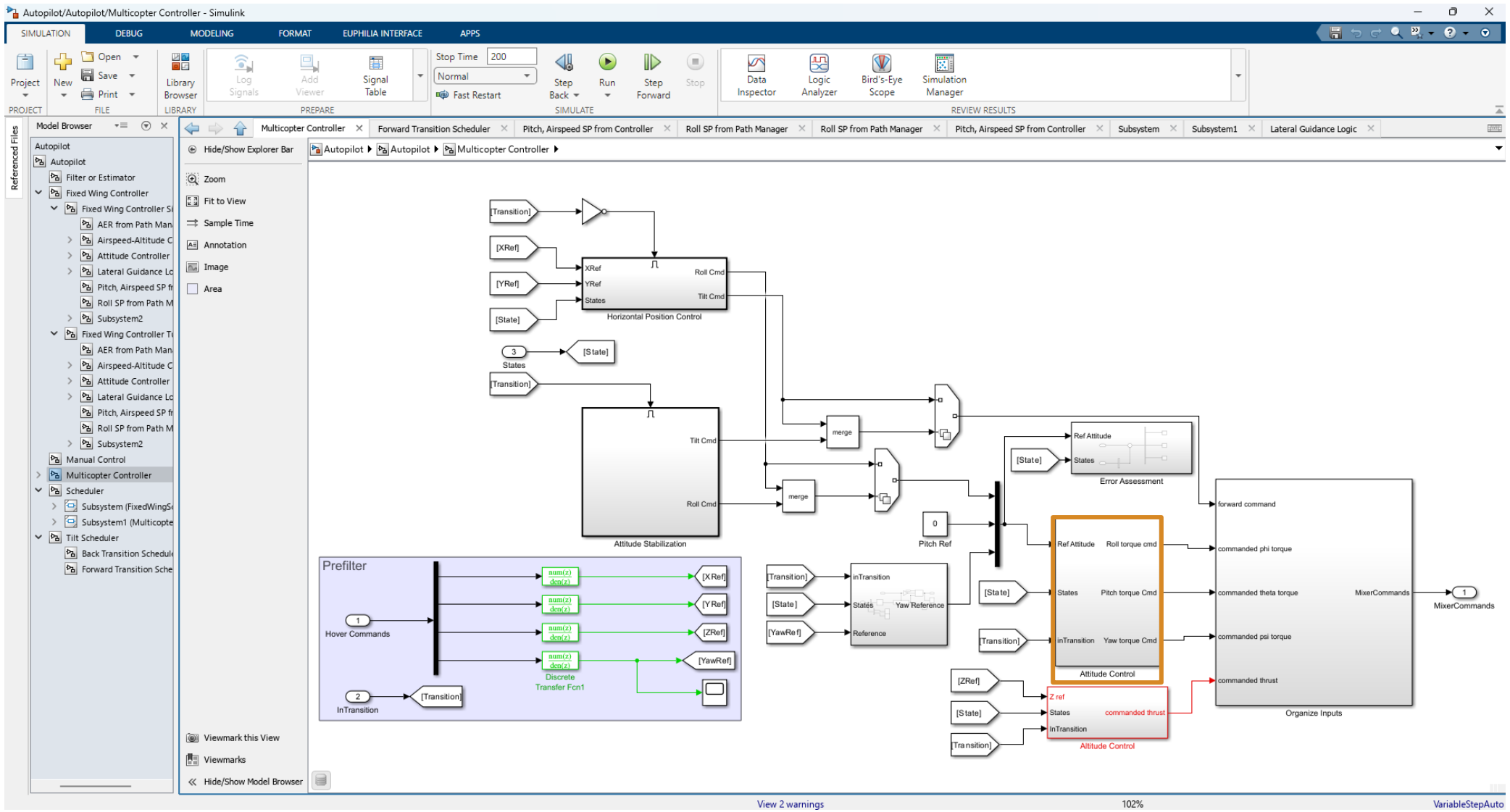


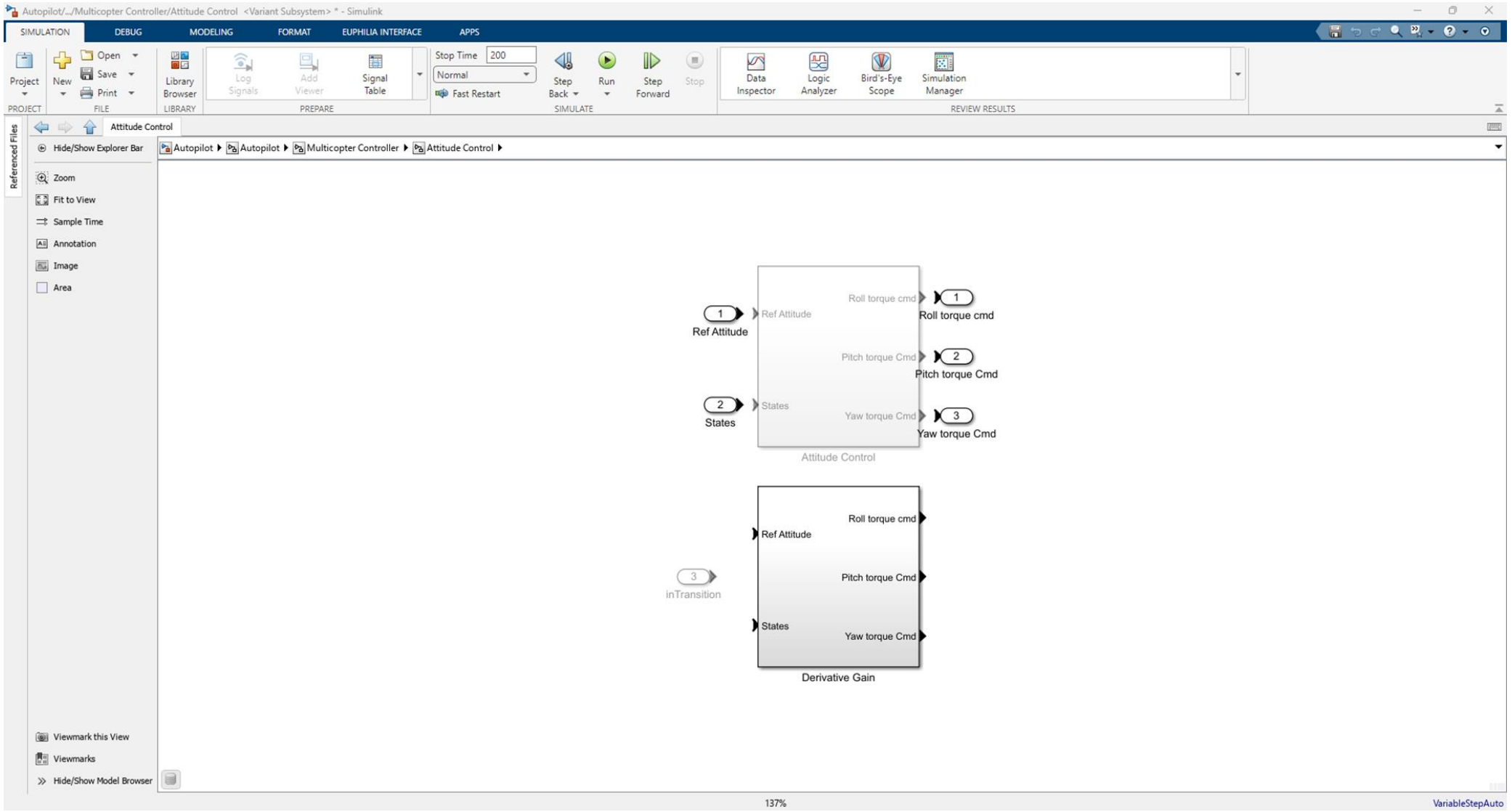
New Controller Development

Control Engineer

After countless cups of coffee, a few minor crises, and just a little procrastination...

New Controller Development

Control Engineer



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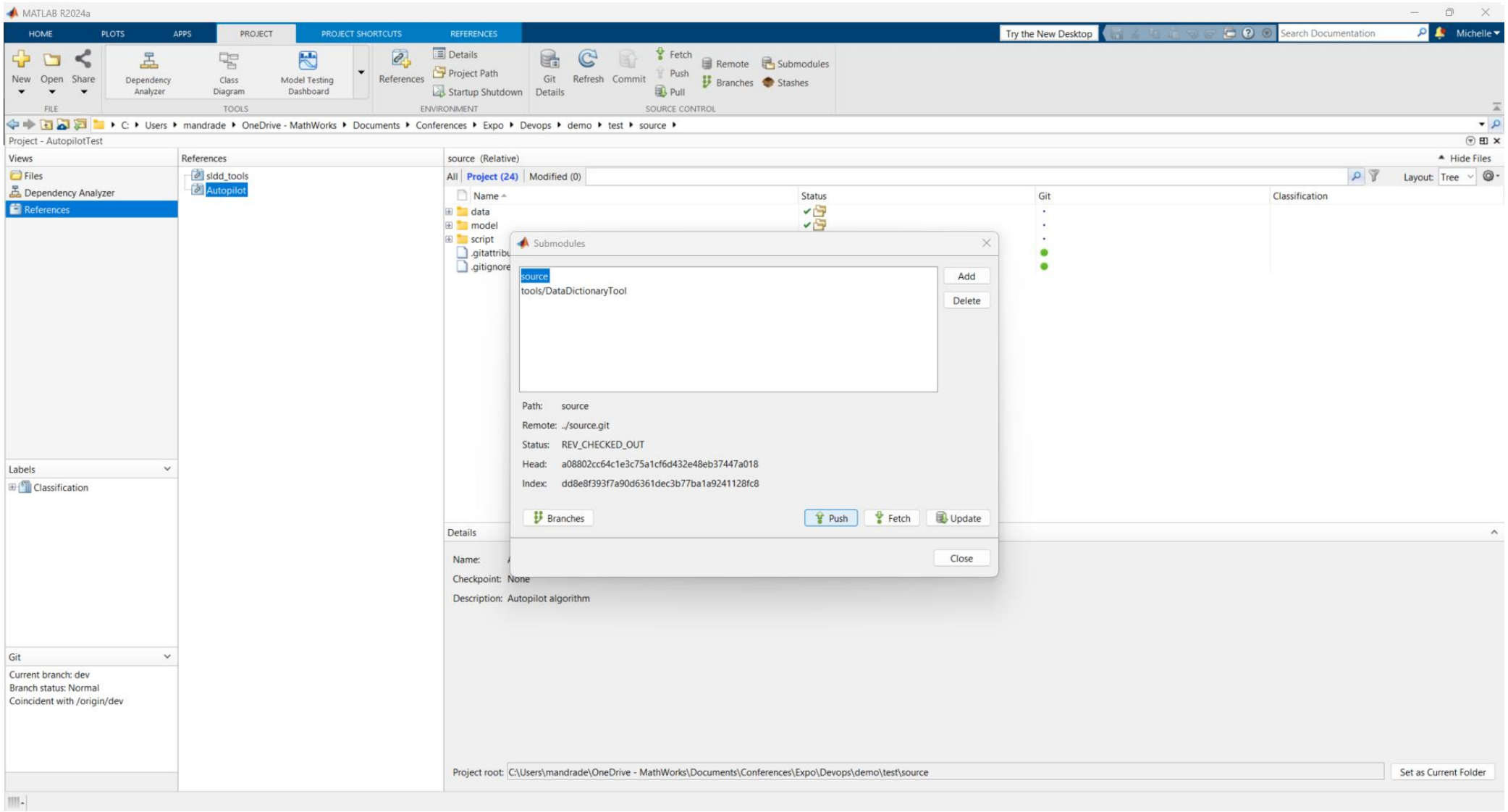
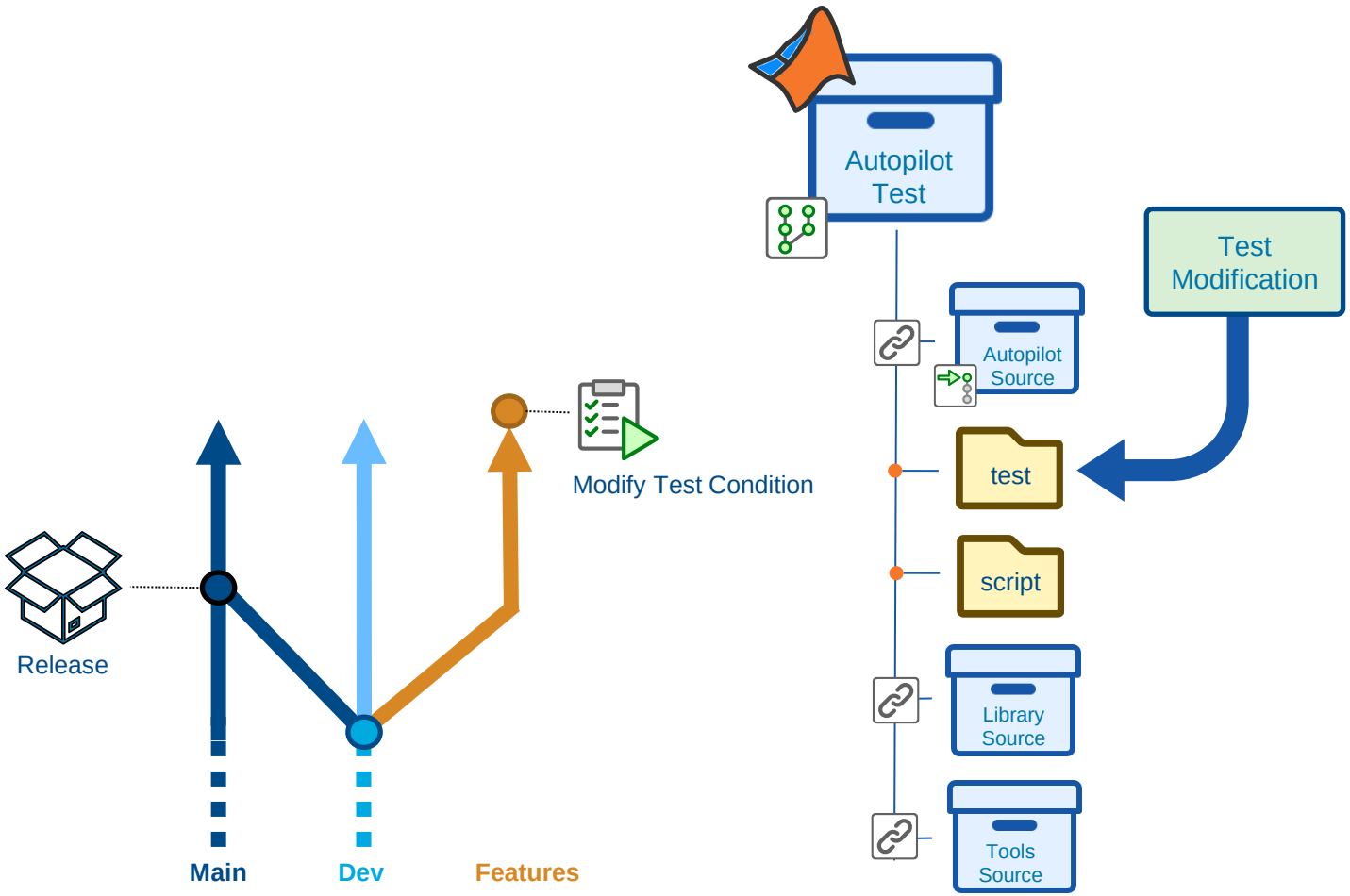


Control Engineer

New test in Autopilot Test



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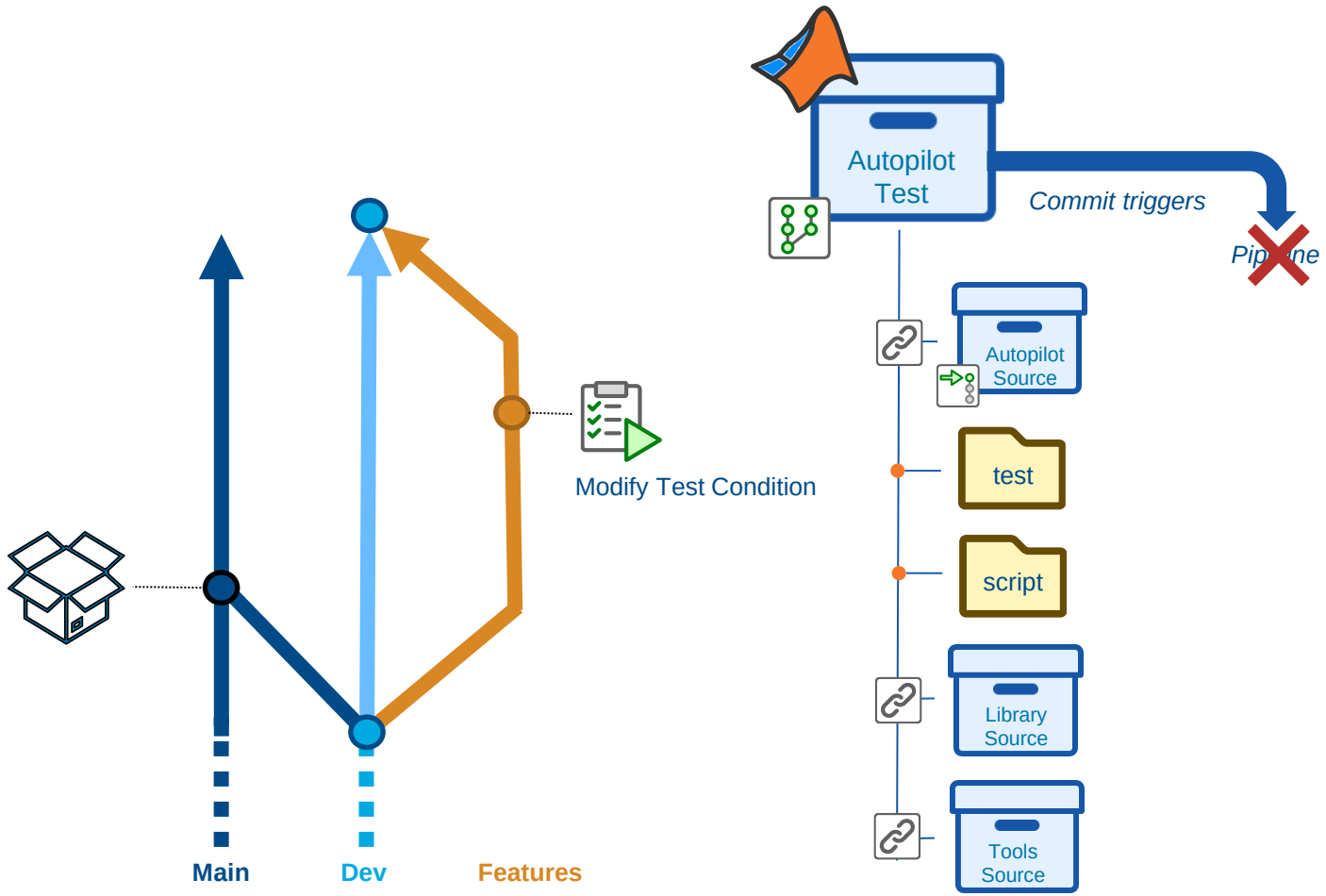
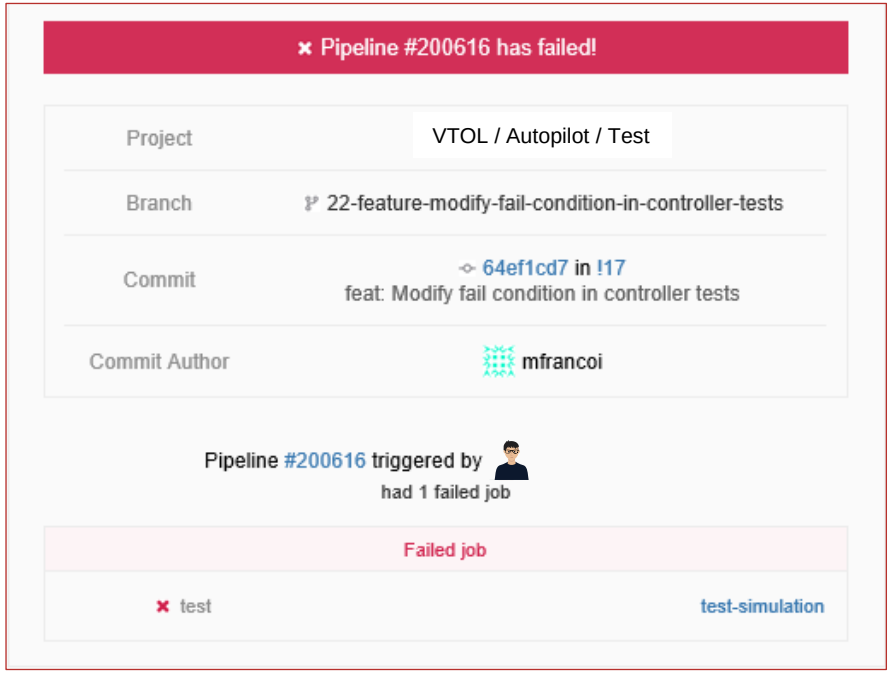
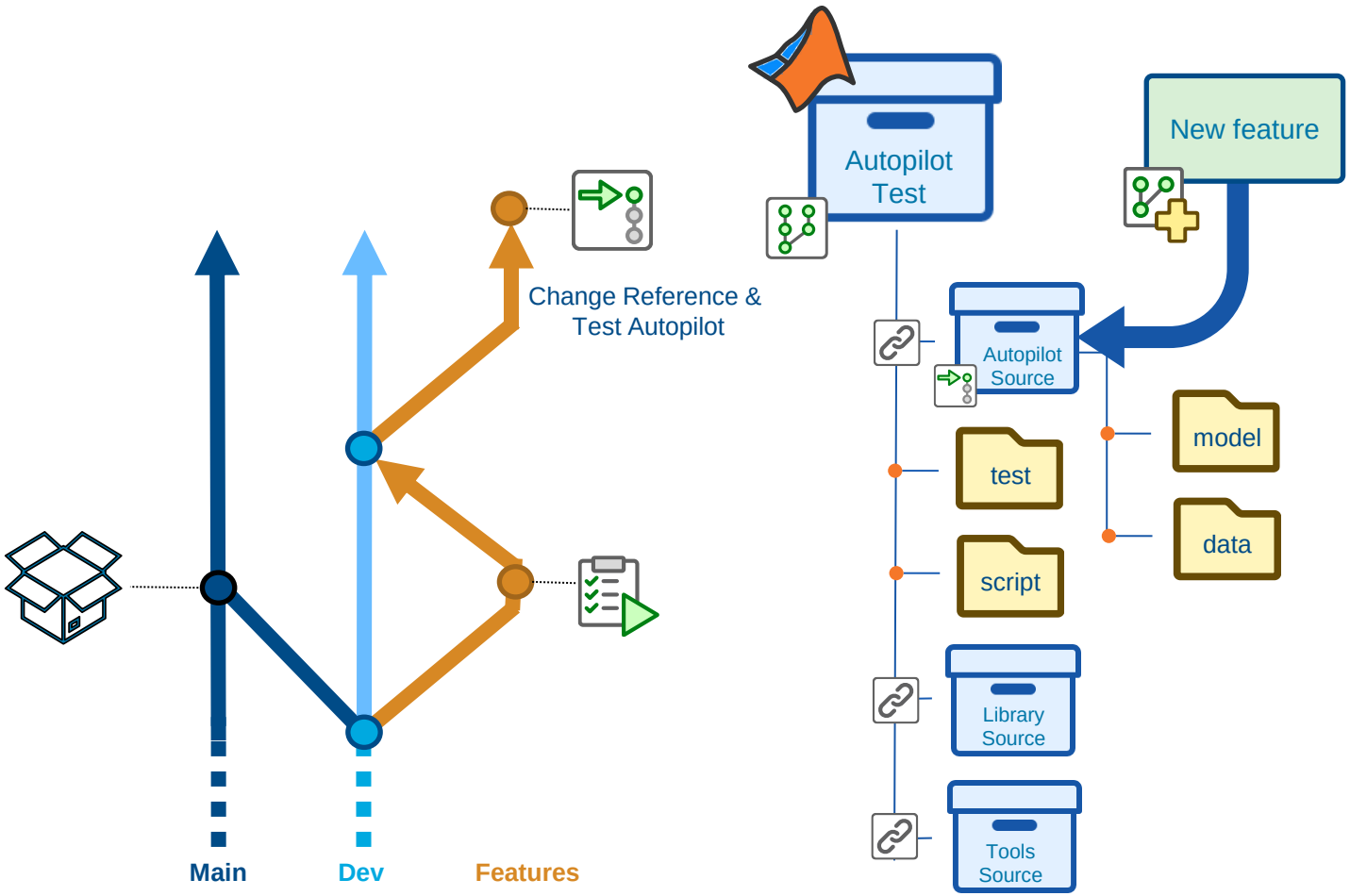




New feature is now on branch Feature



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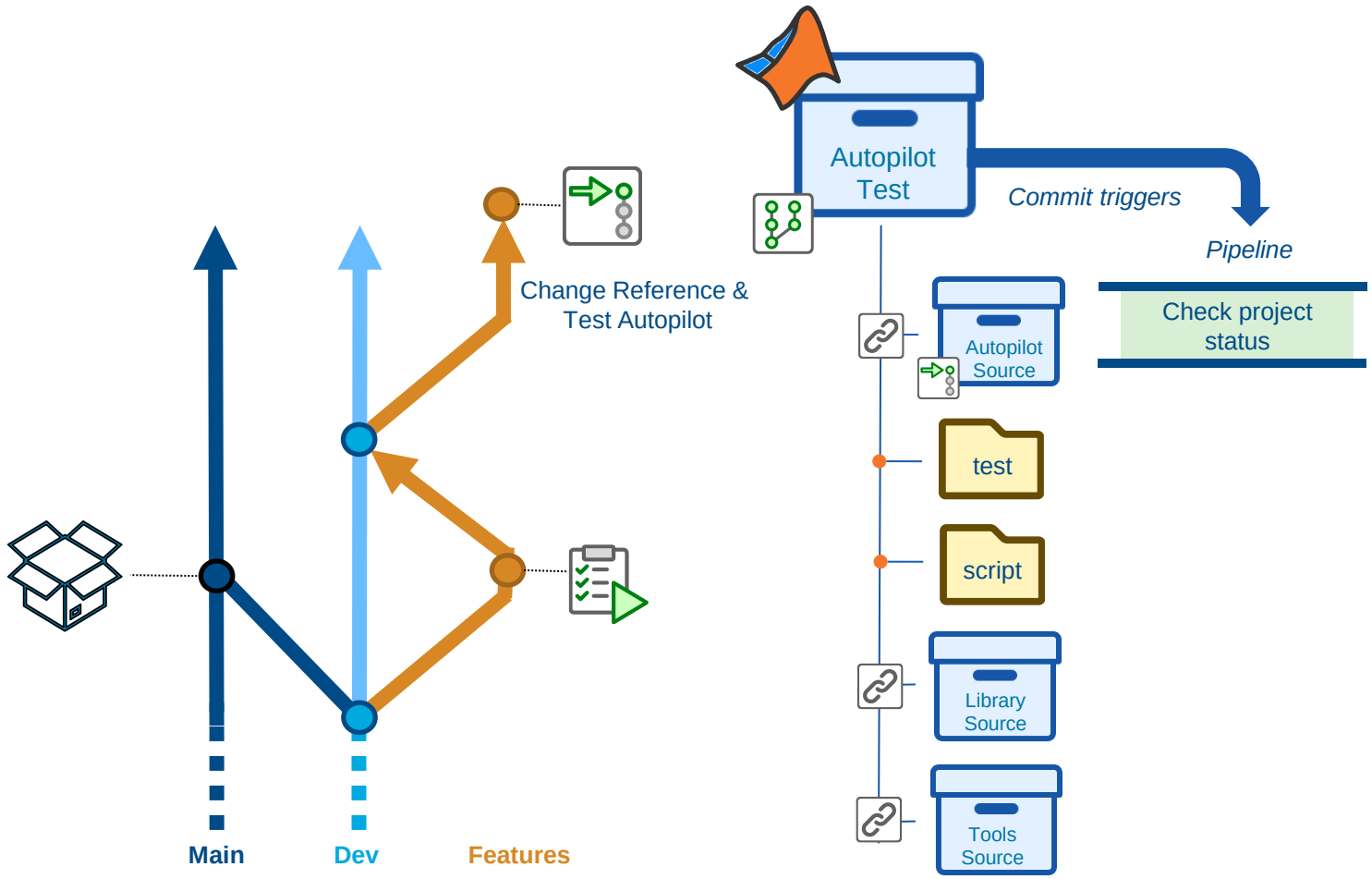

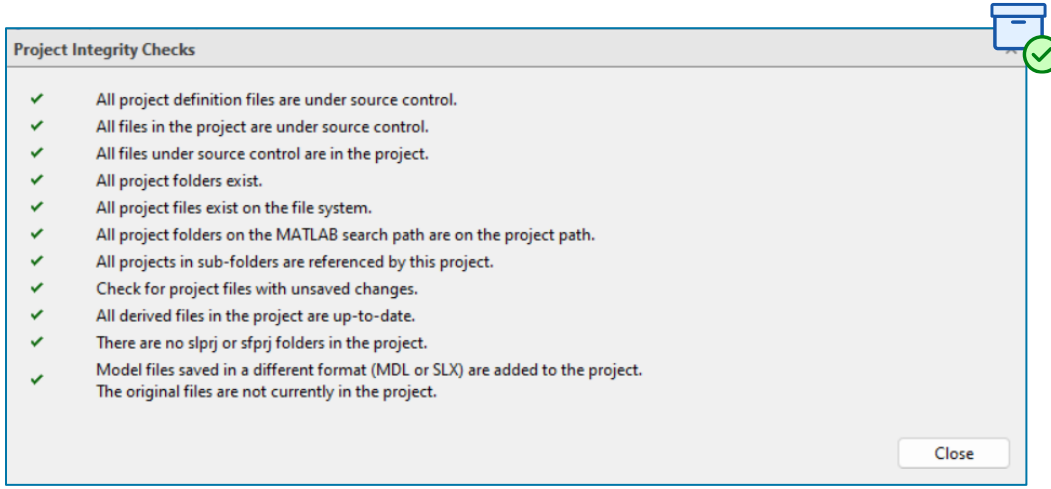

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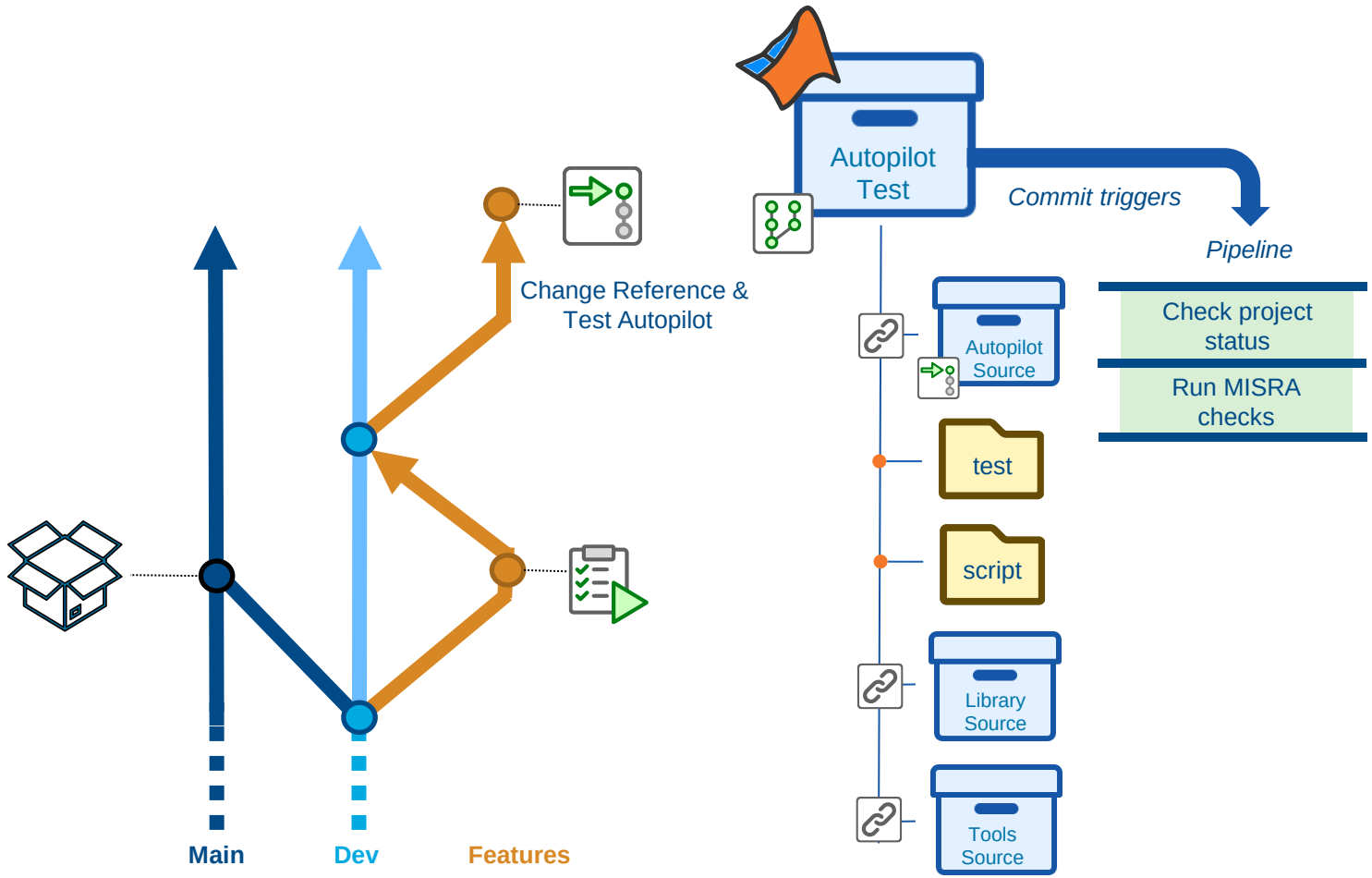
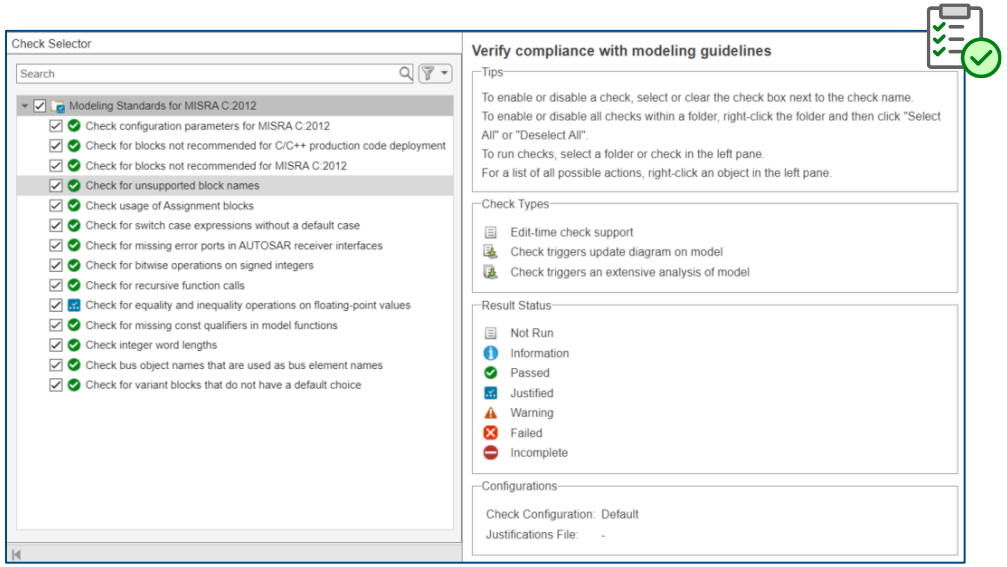
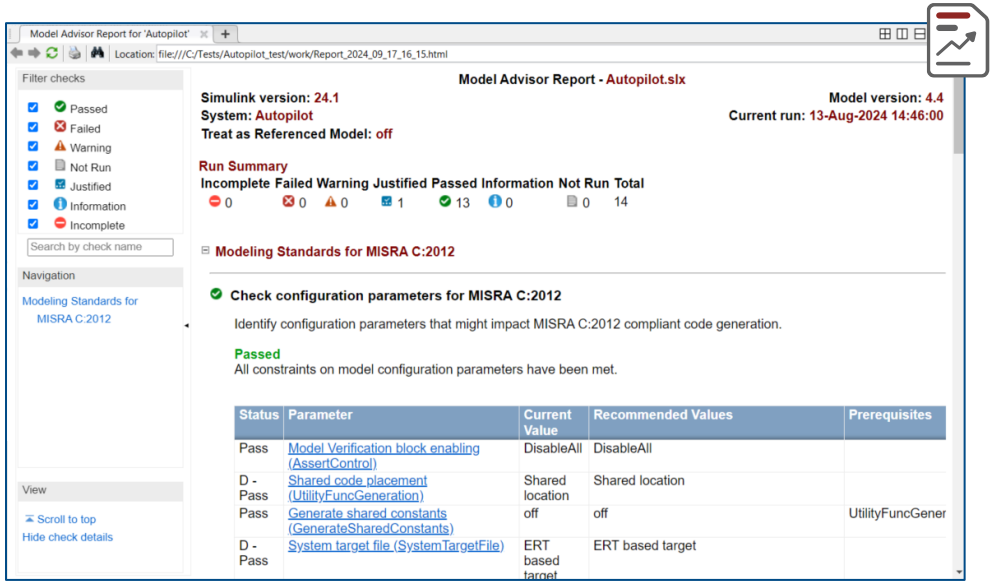
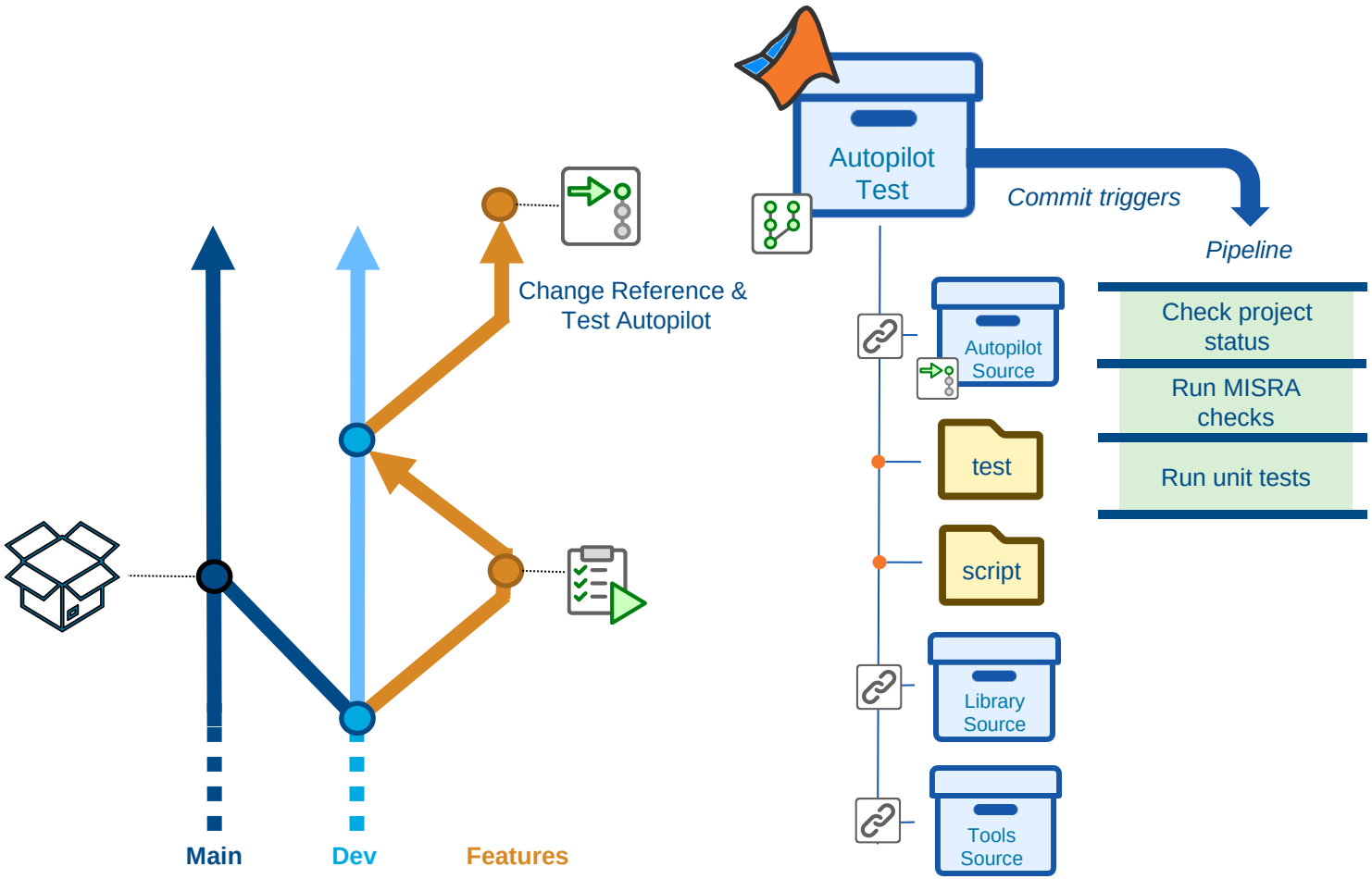
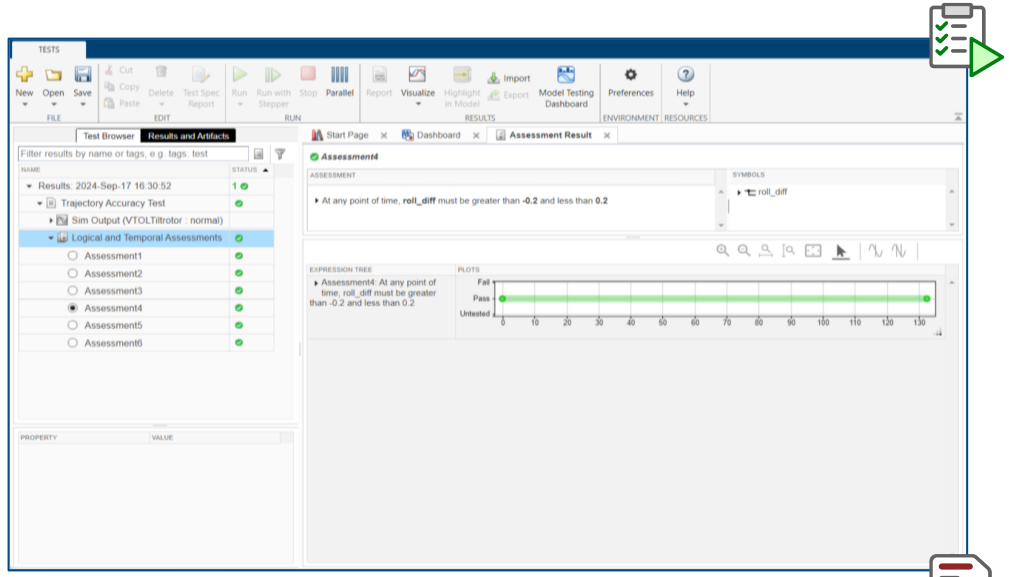


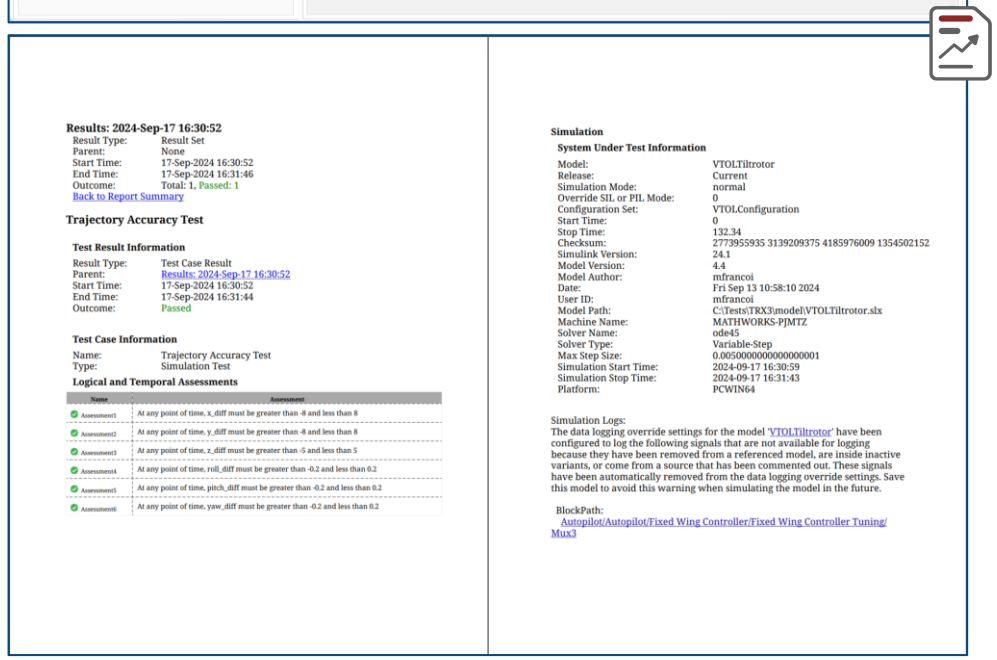




New feature is now on branch Feature







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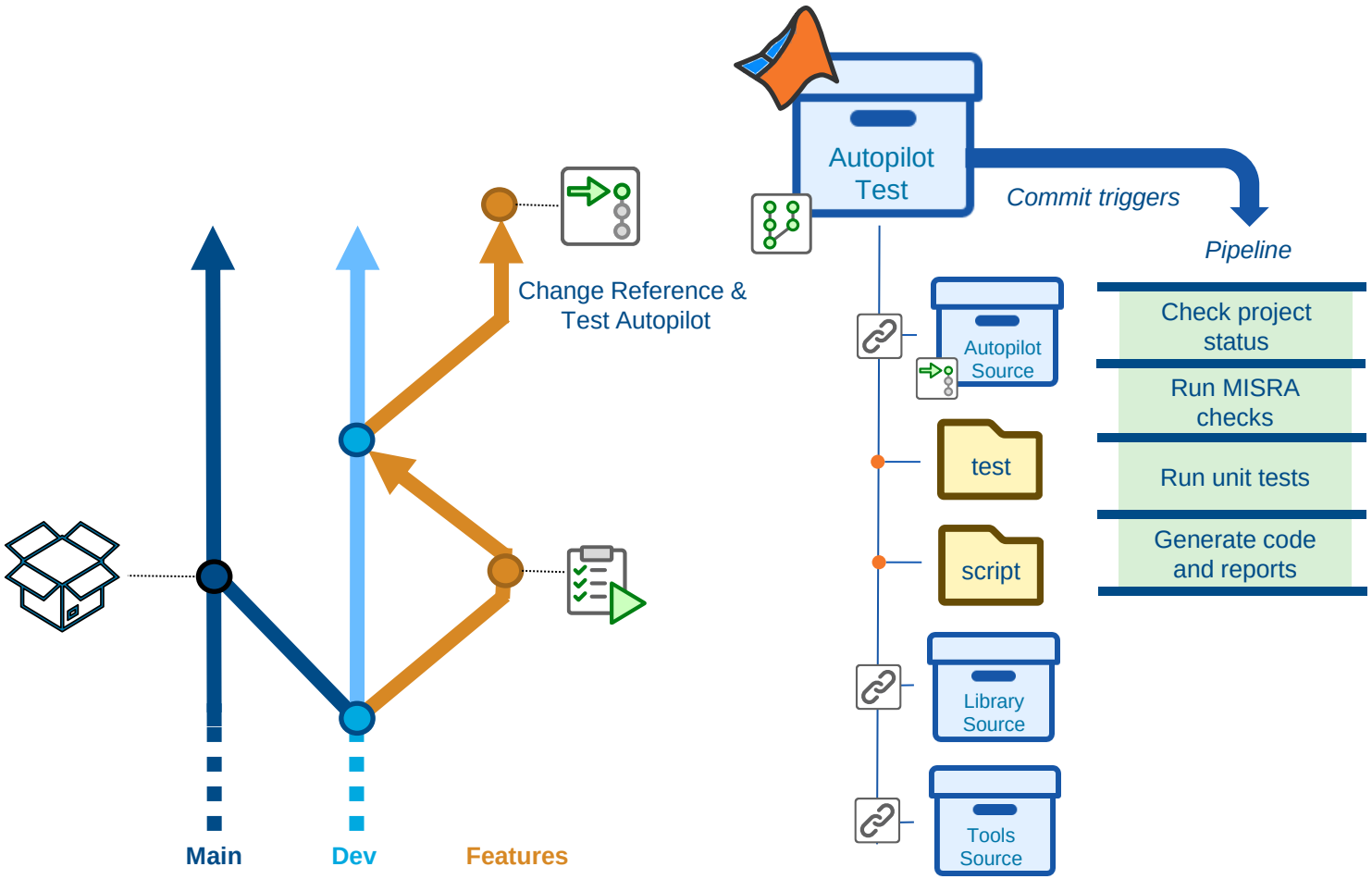
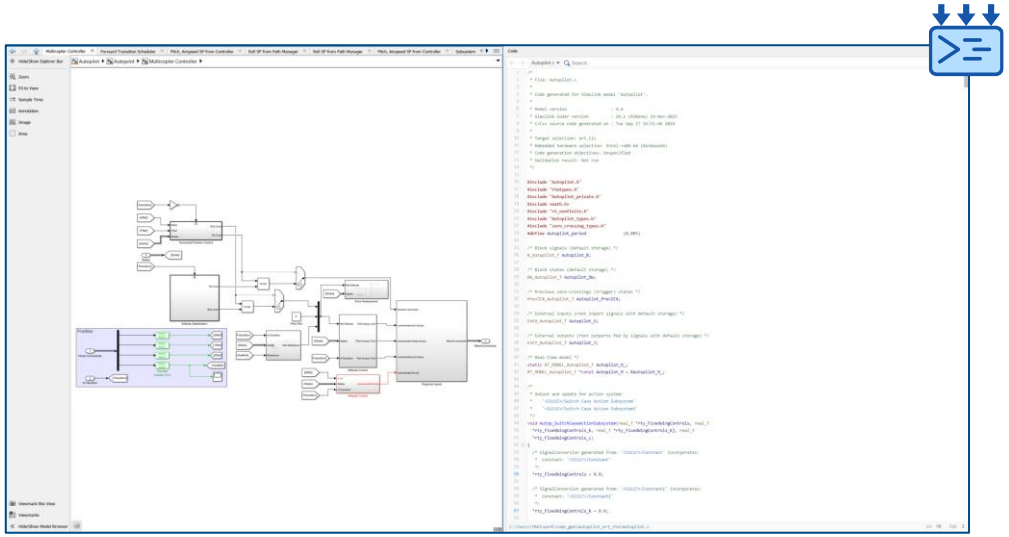
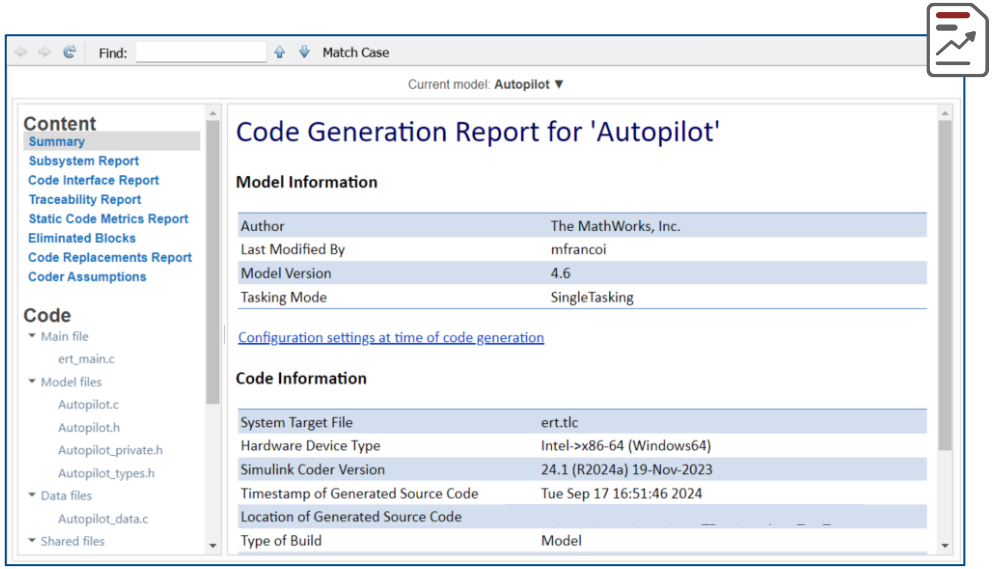
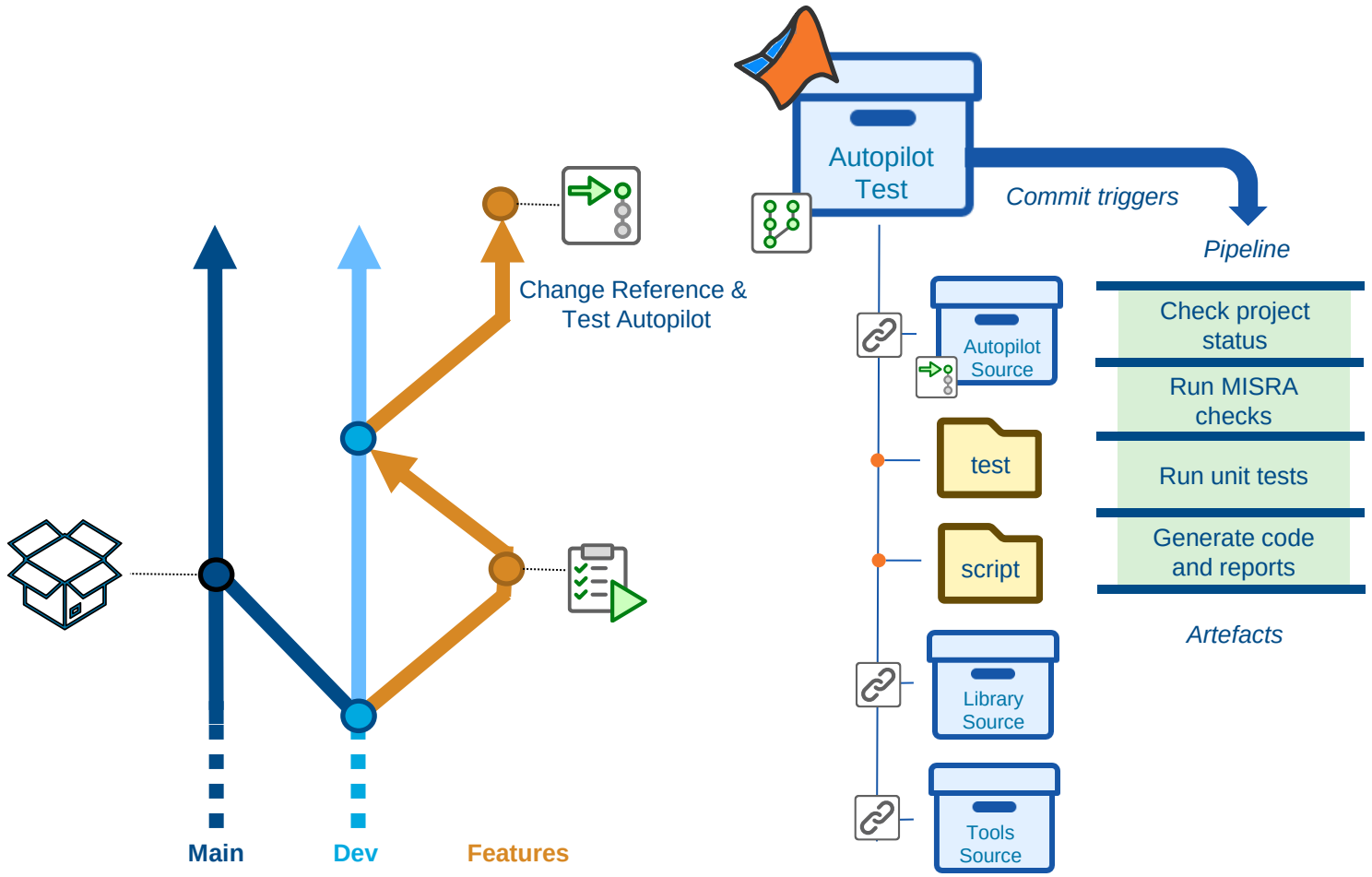
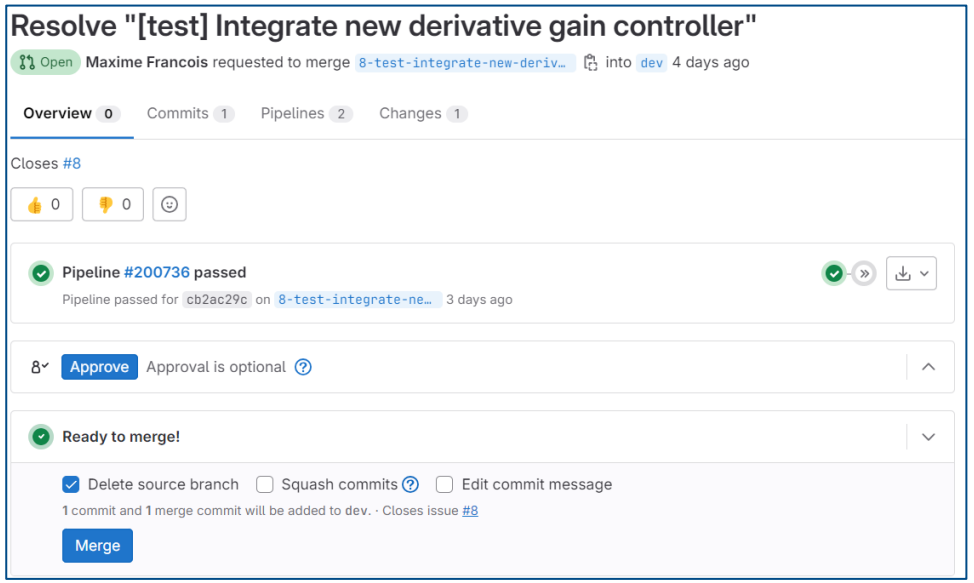


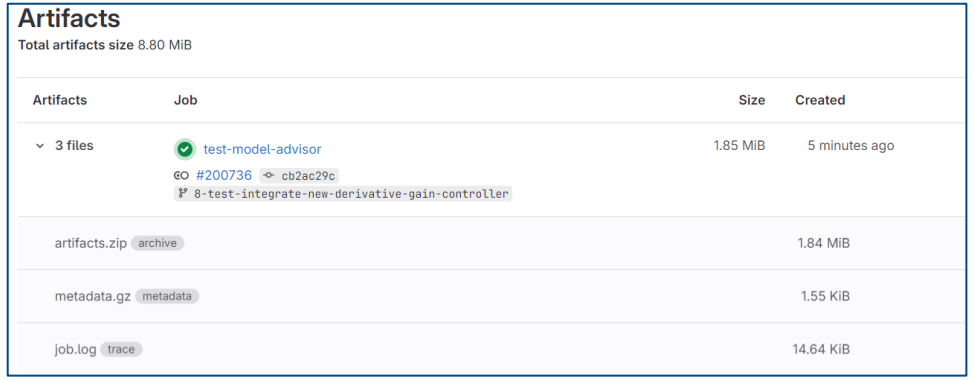




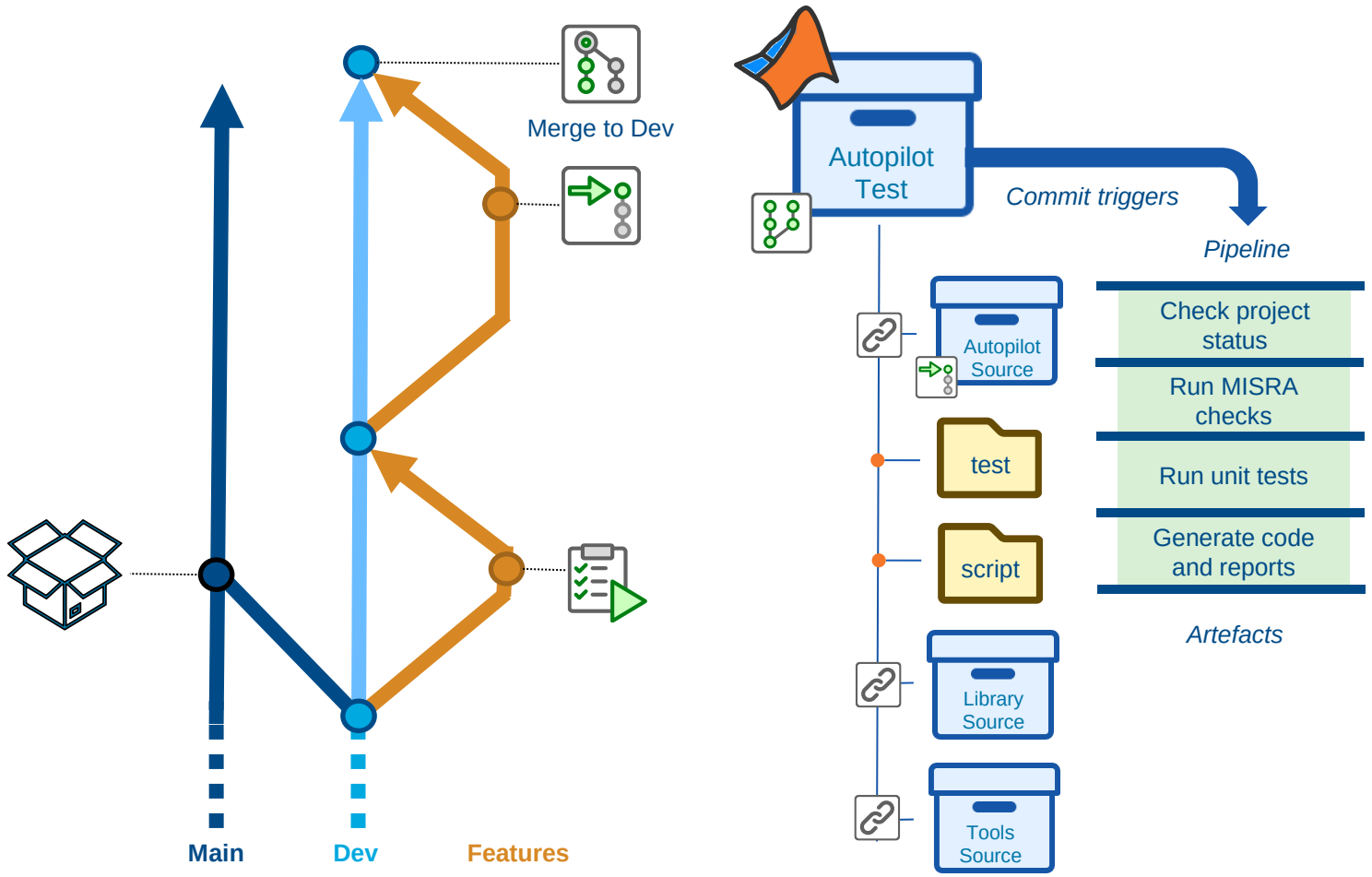
New feature is now on branch Feature

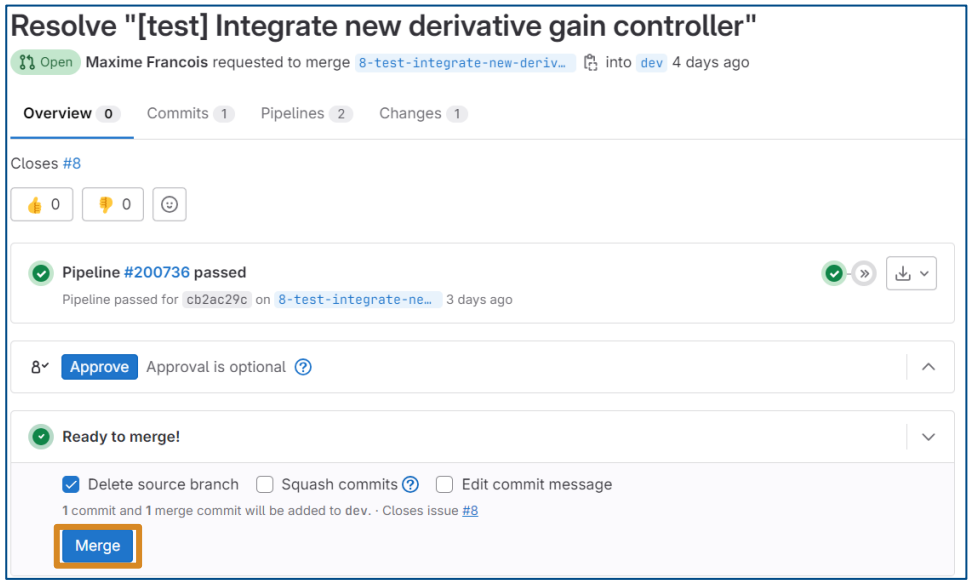




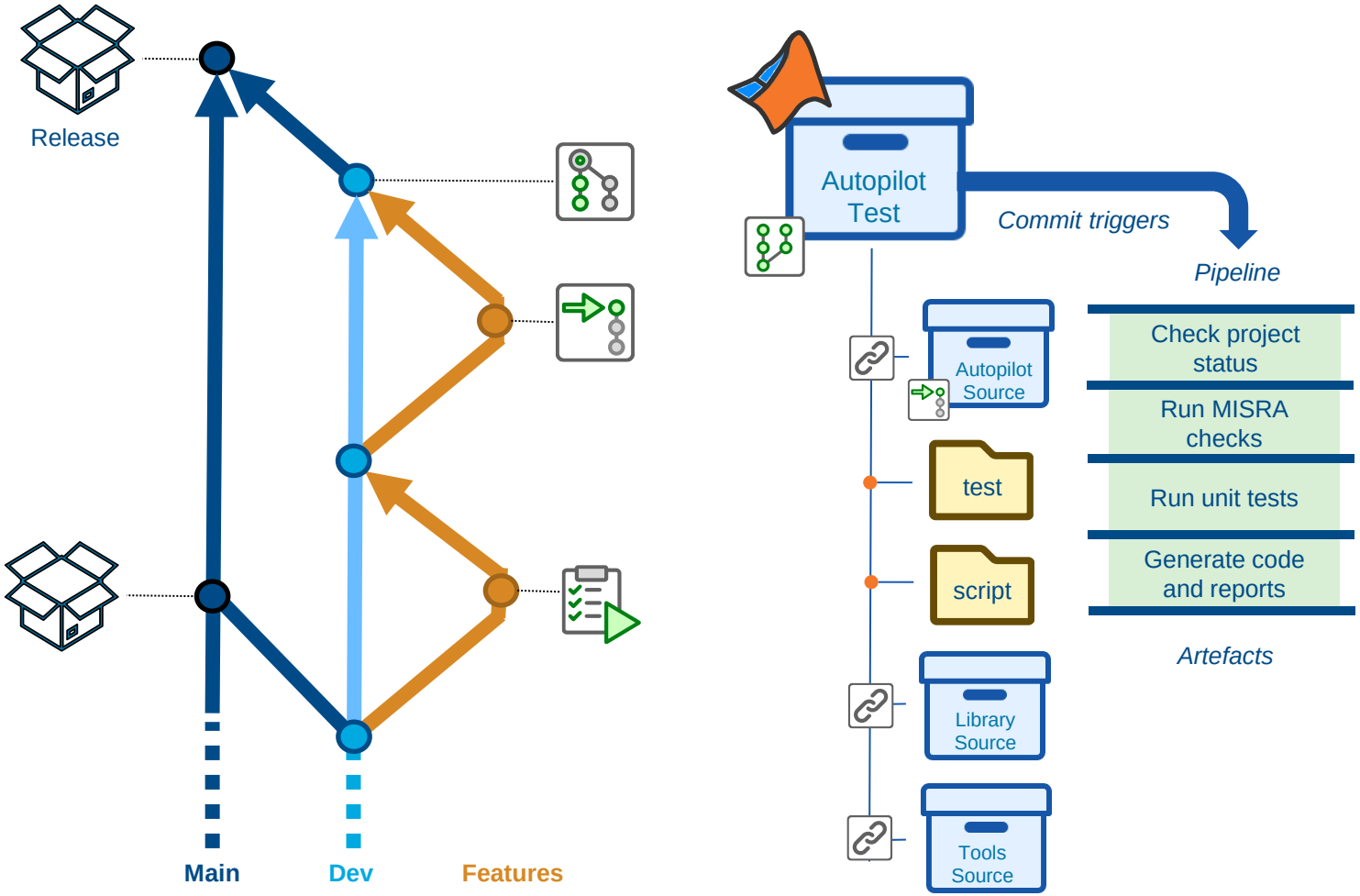


Feature branch is ready to merge in Dev

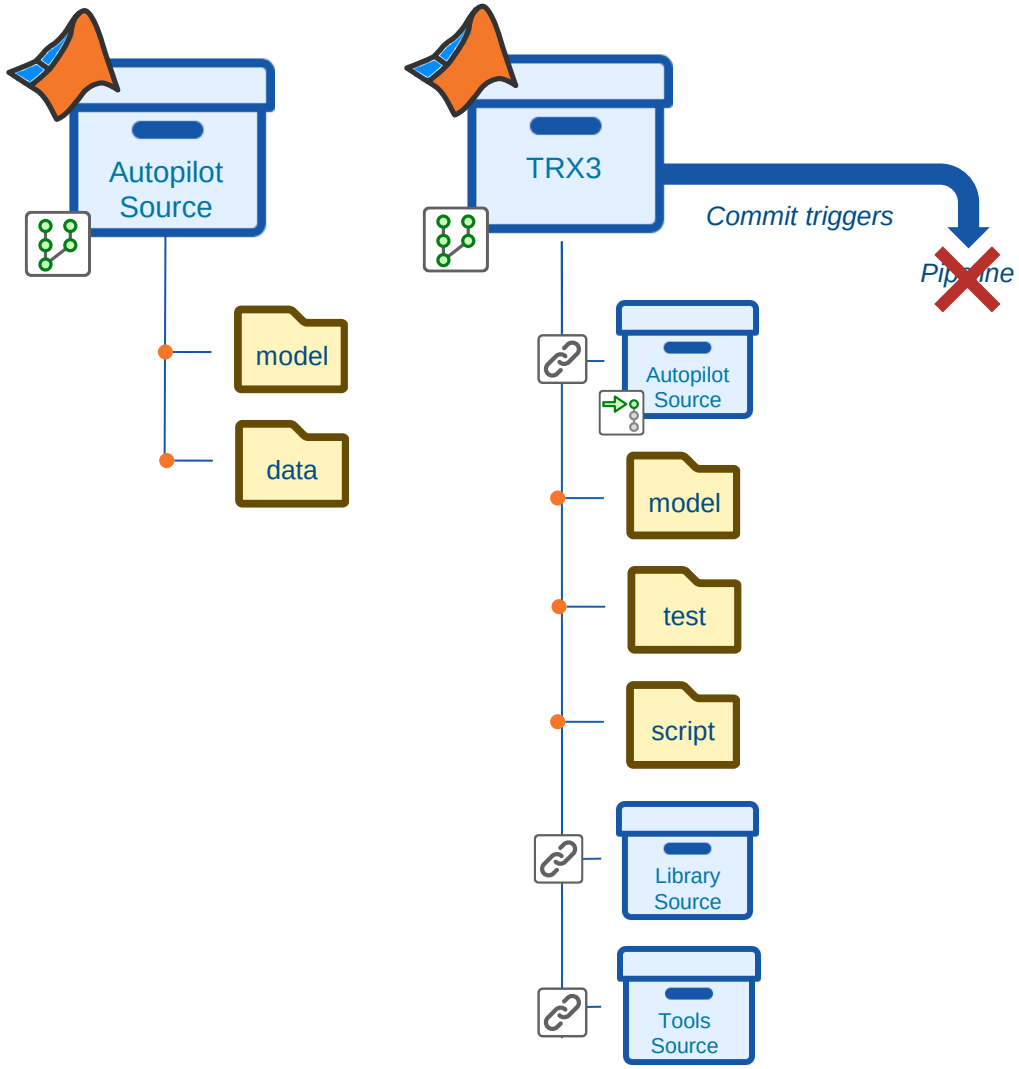


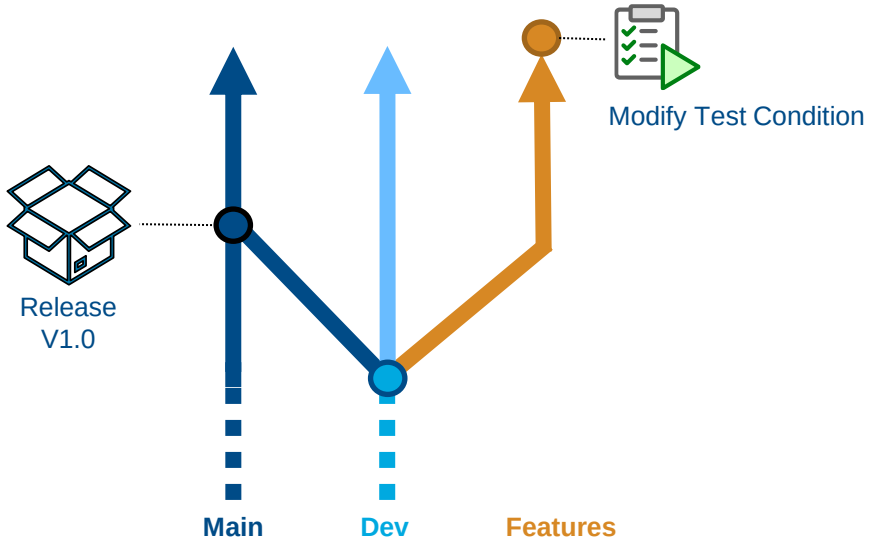


Dev branch is ready to merge in Main



Integrate new controller to TRX3





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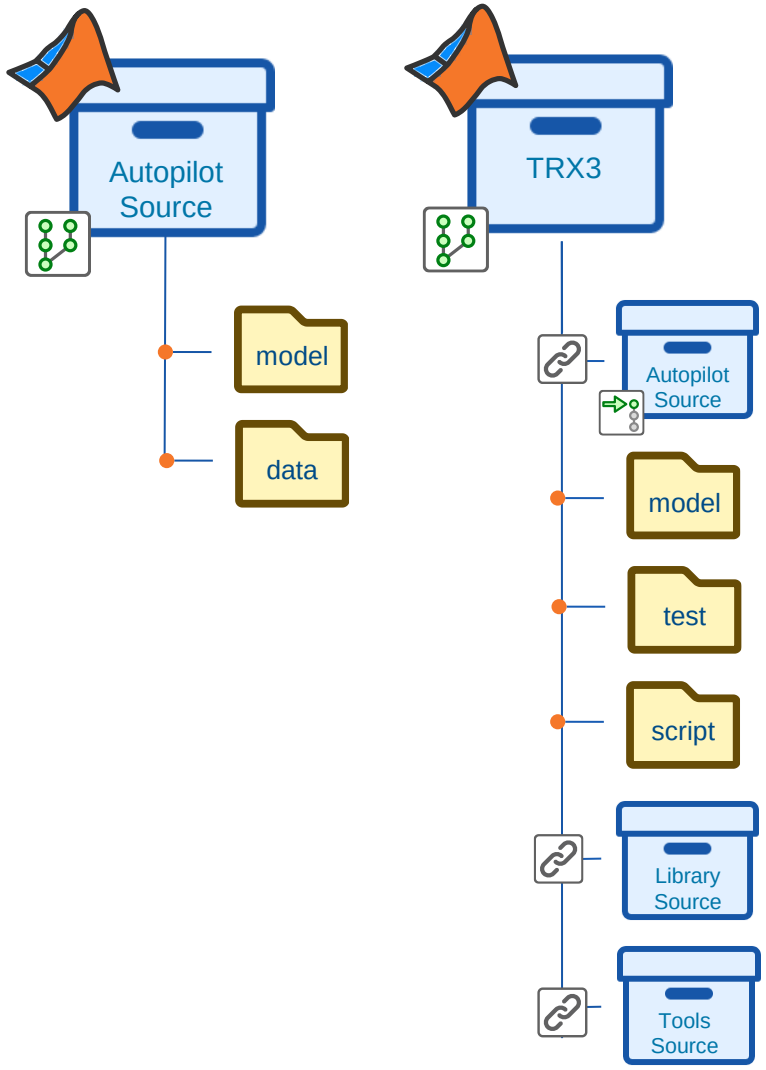

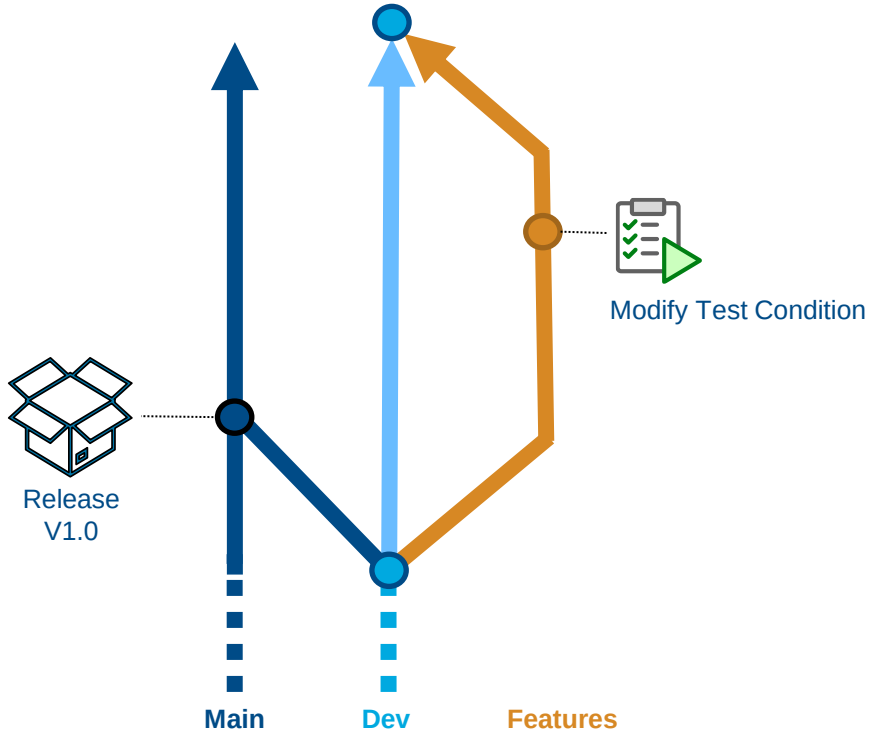

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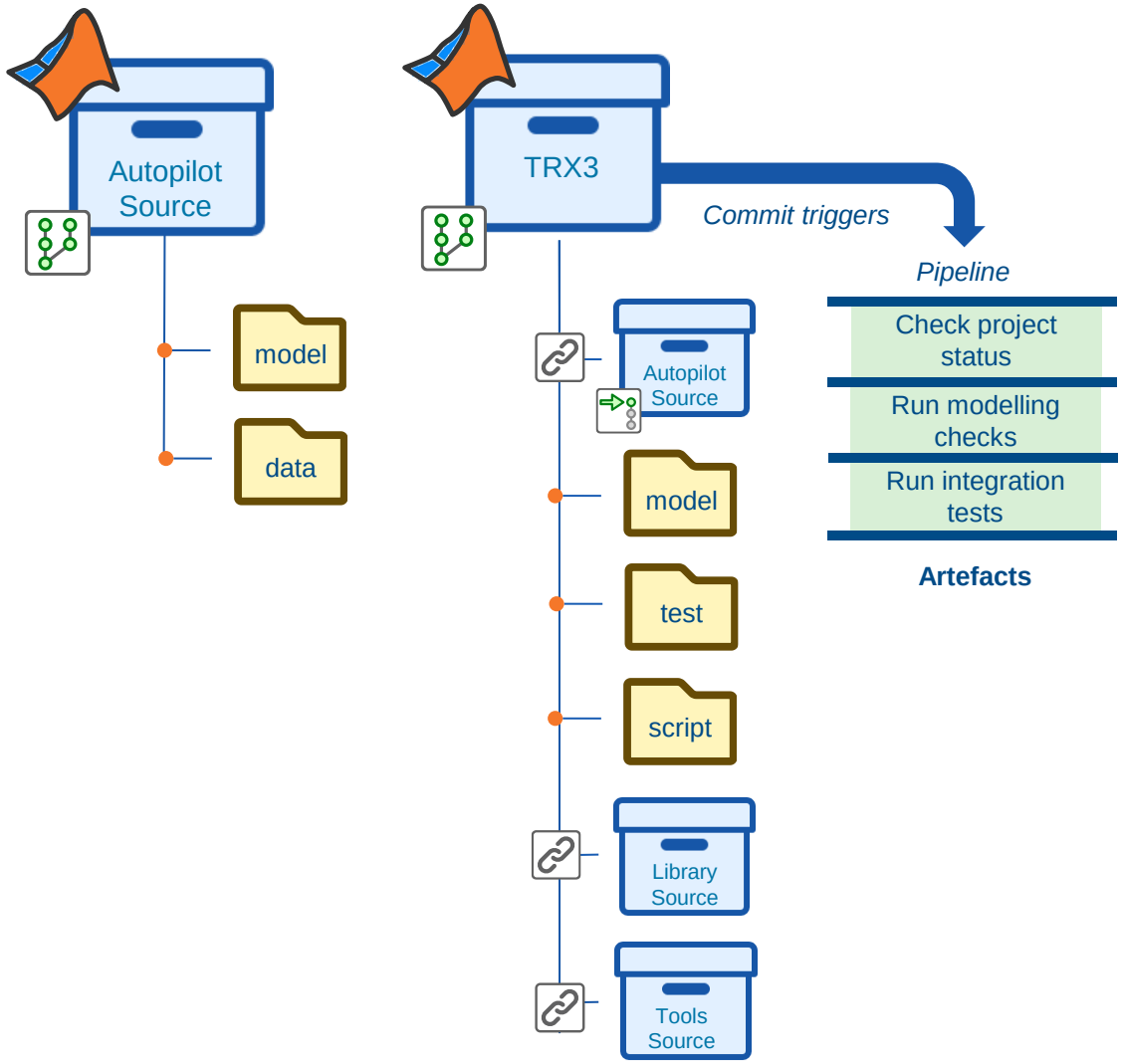
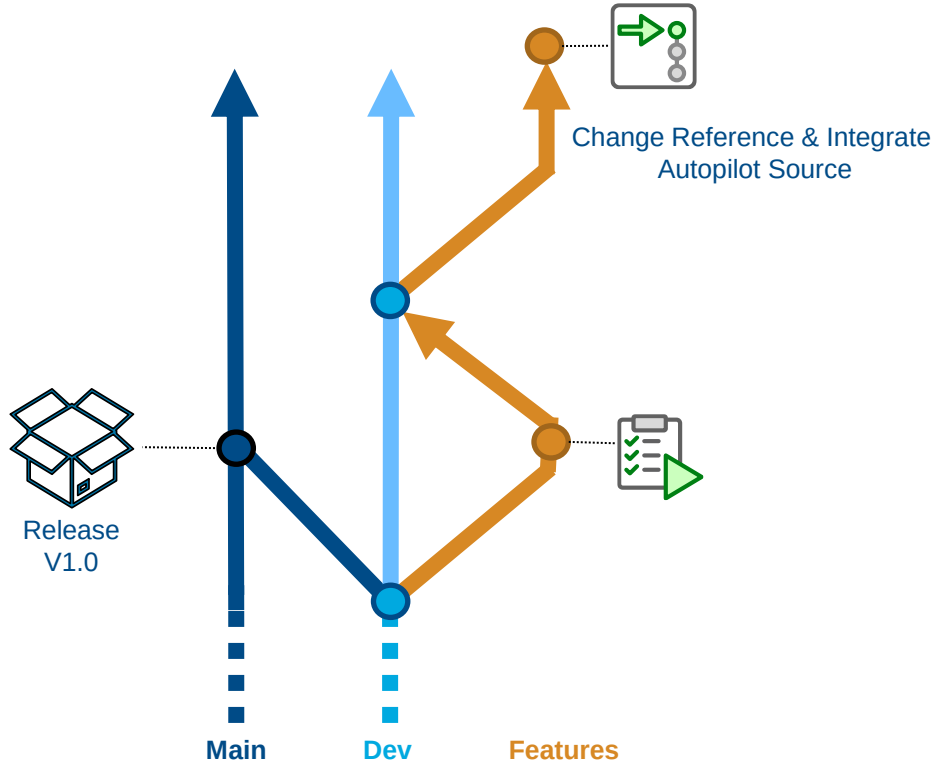
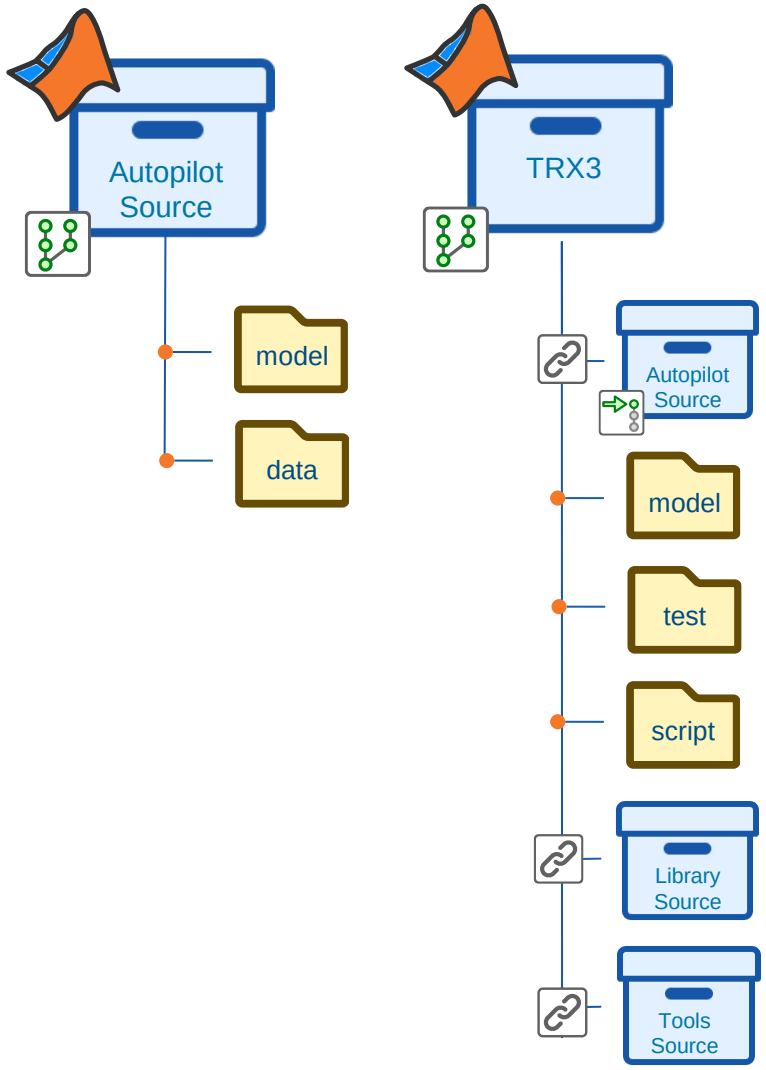
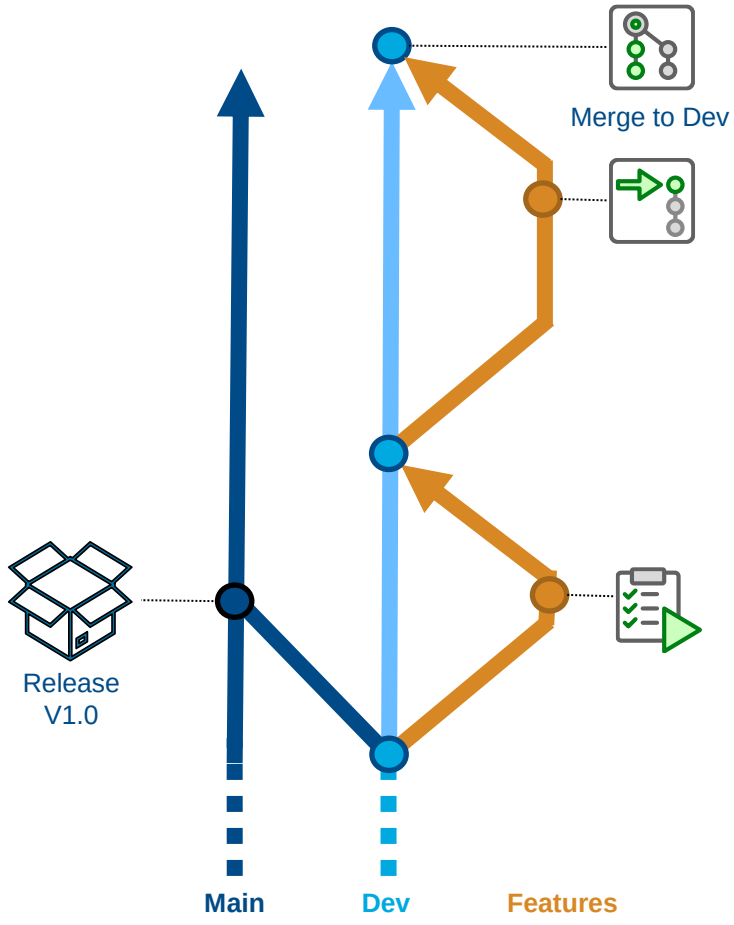


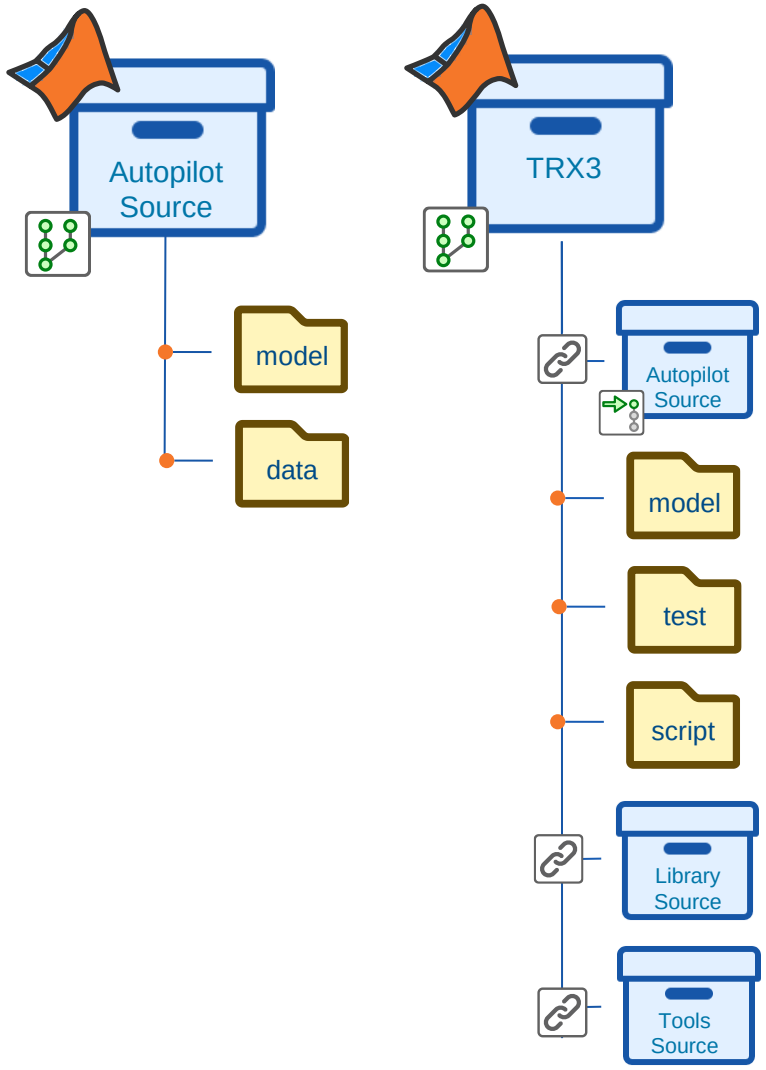


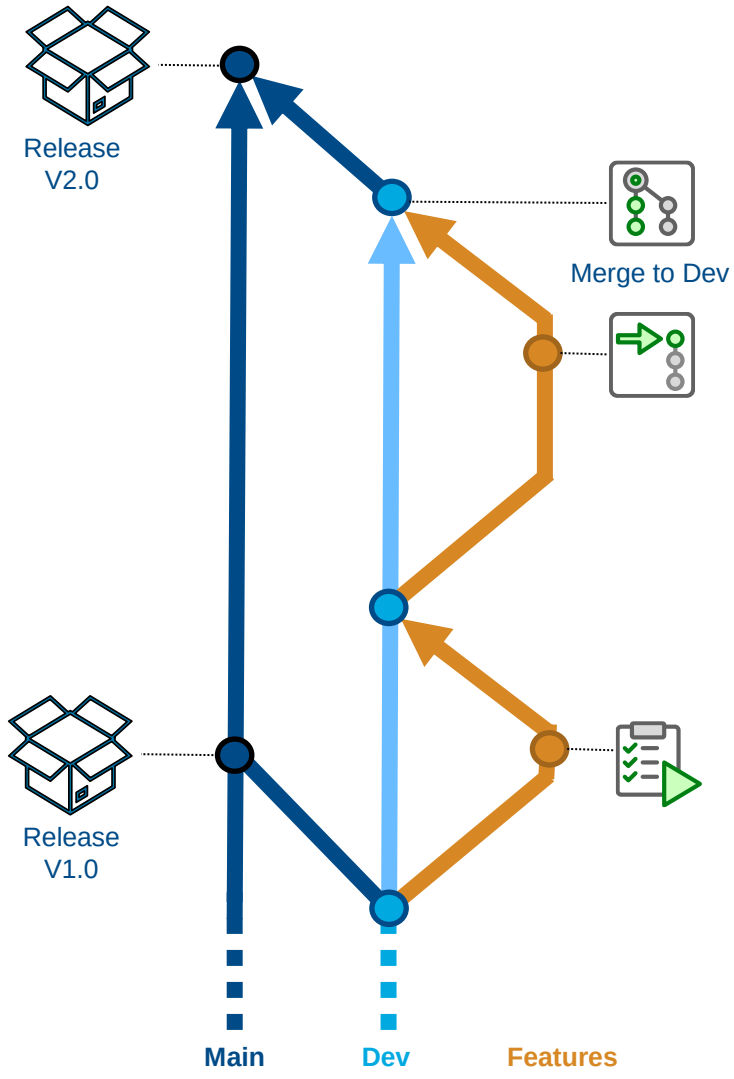
Integrate new controller to TRX3





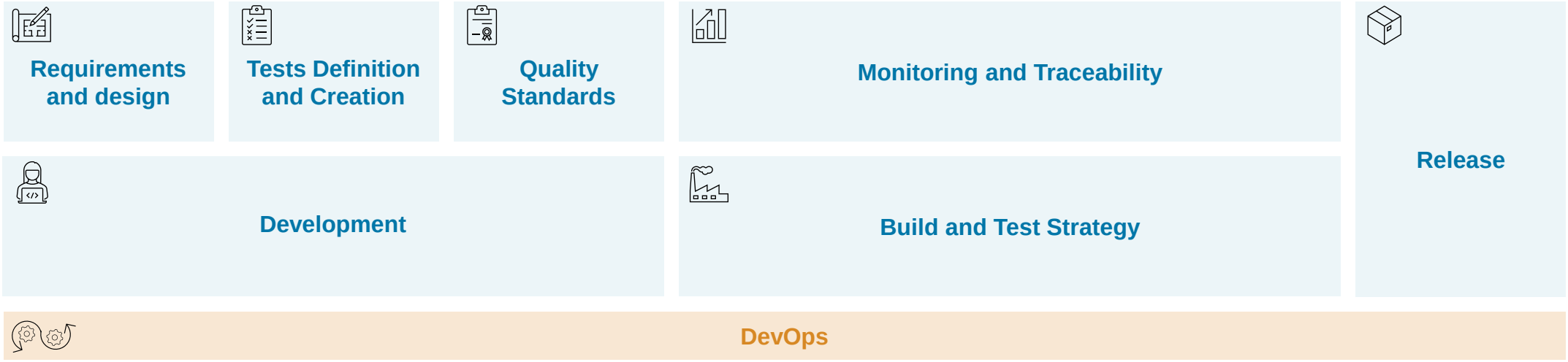
Integrate new controller to TRX3





Conclusion

Industrializing Development with MATLAB & Simulink



Next Steps

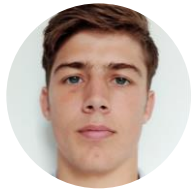
Improve your software development

Enhance Automation

Scale Up

Reach out for support to implement these practices in your projects

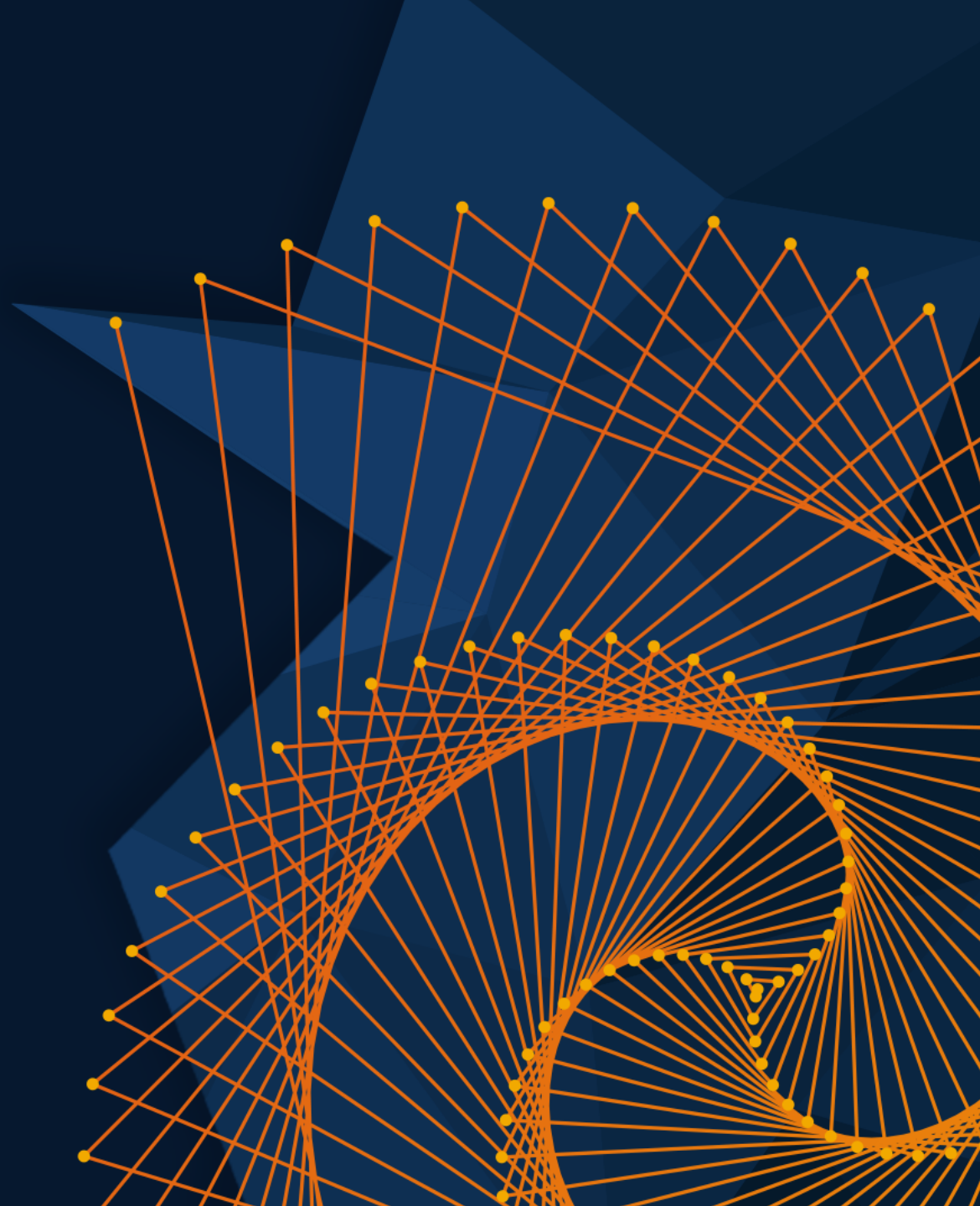
Michelle Valente
mandrade@mathworks.com



Maxime François
mfrancoi@mathworks.com

MATLAB EXPO

Merci



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