

# Duckify

Week 5 review



# Milestone

## *About the week 5*

Using the **complete pipeline**, starting from an **orchestration interface**, draw **AI-generated contours**, on a duck using **multiple colors** with **automatical changes**.

# GenAi – Milestones & TODO

**MV-Adapter Text2Texture** : Prompt Engineering , benchmarking

- Why : automated benchmark needs refinement to transmit information

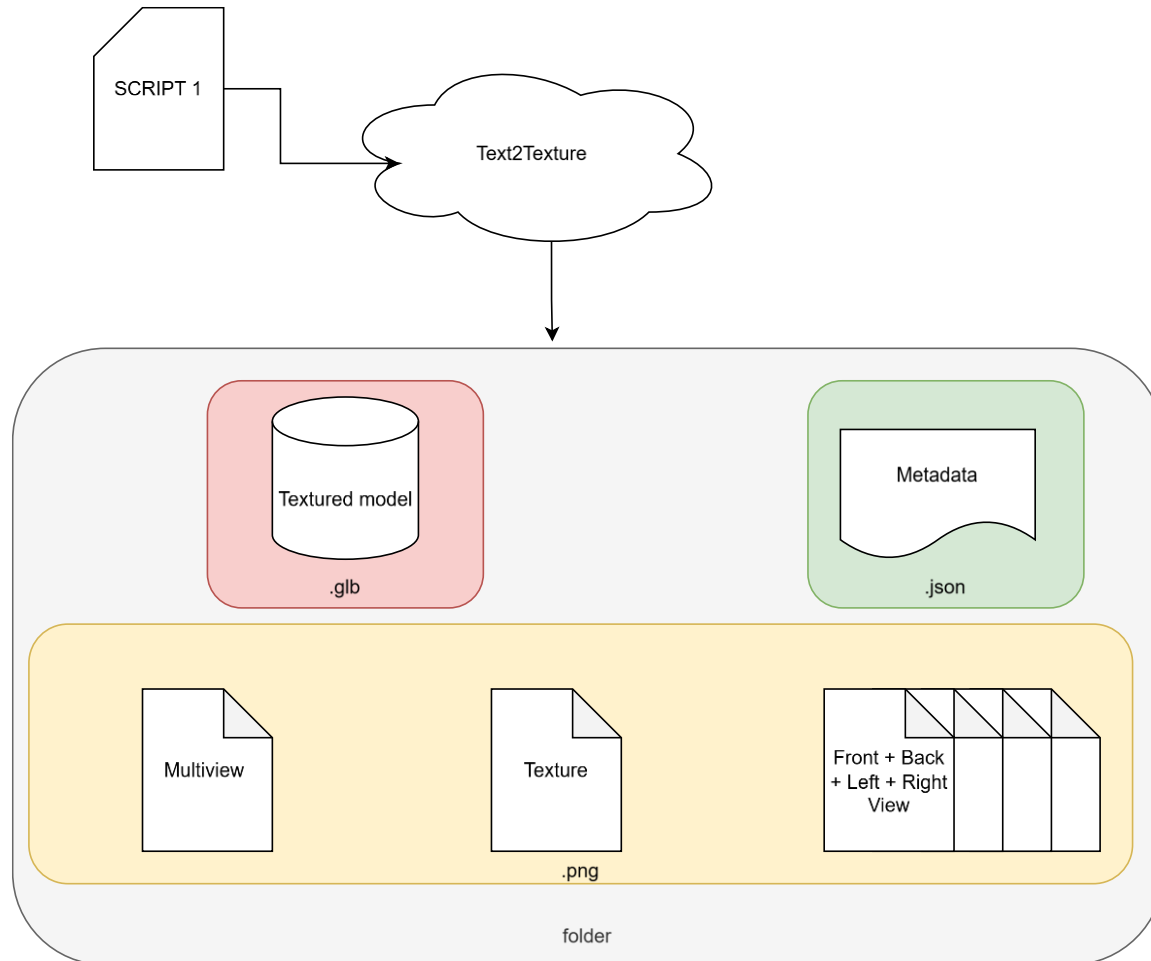


**GenAi Pipeline** : Have it integrated to the main project pipeline

- Why : Time constraint -> Will be integrated next week

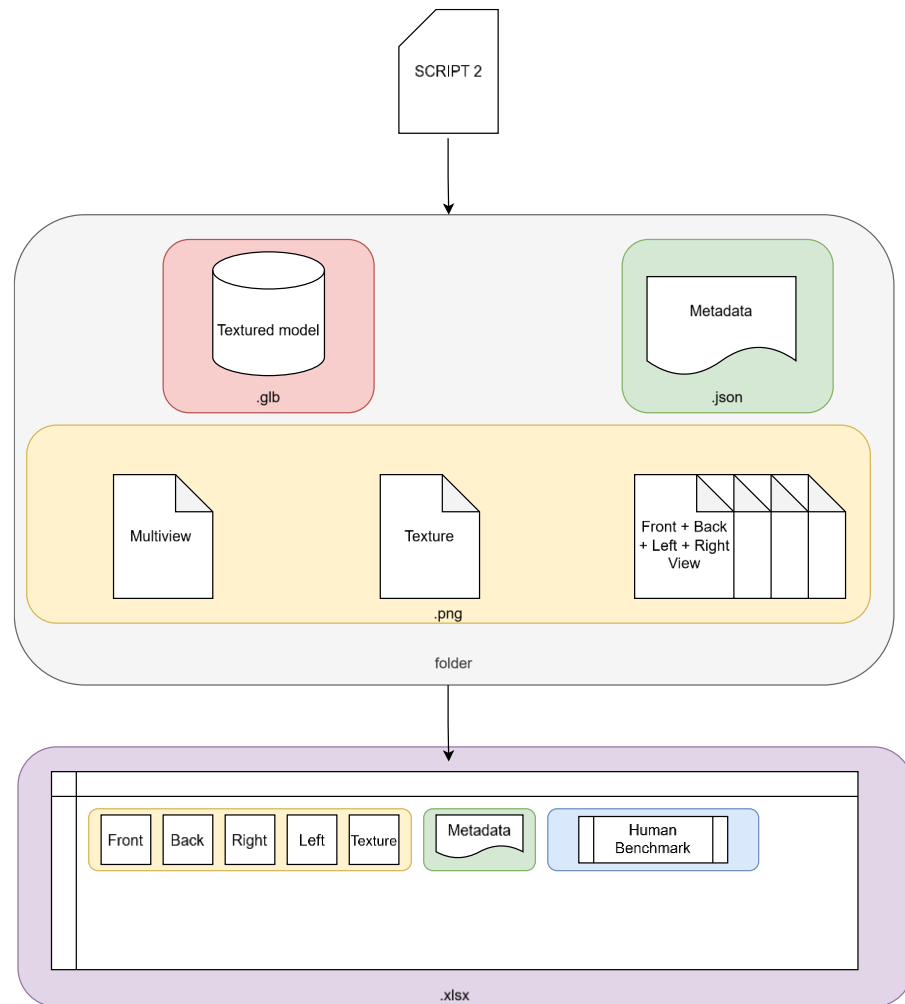


# GenAi – MV-Adapter Text2Texture



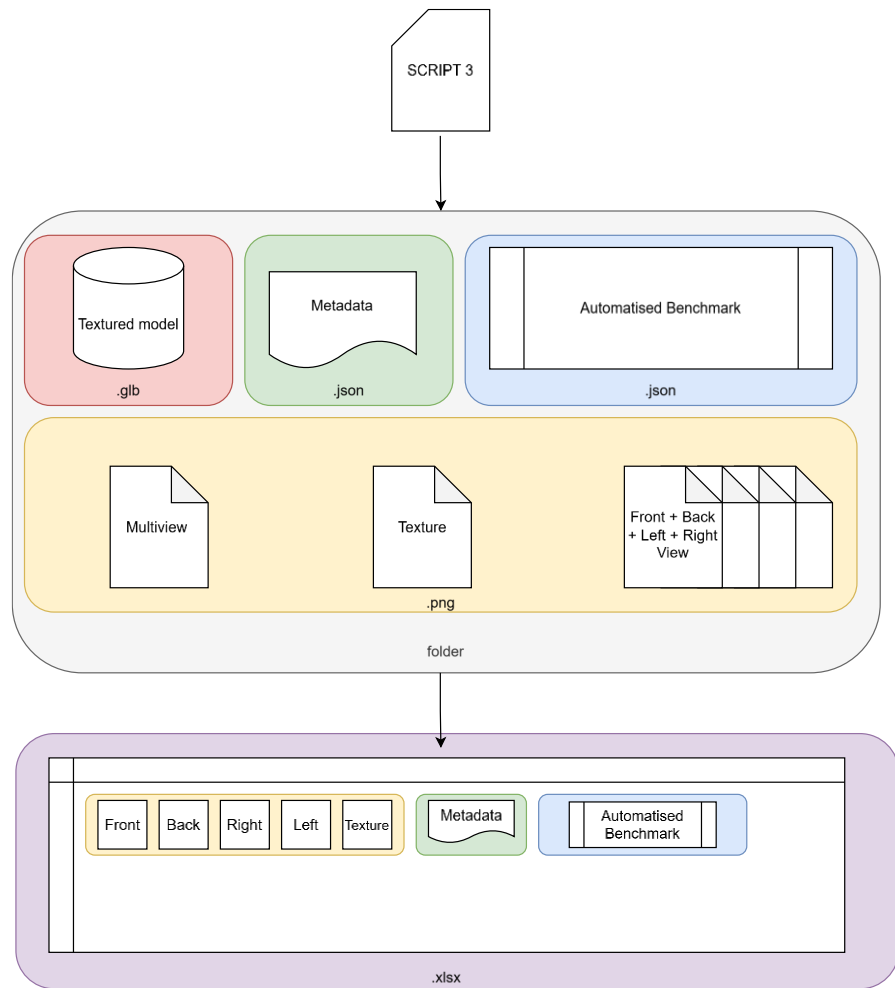
- Génération de canard
  - Valorisation des données
- PirateDuck
  - Gen1
    - Front.png
    - Back.png
    - Left.png
    - Right.png
    - Multiview.png
    - Metadata.json
    - PirateDuck.glb
  - Gen2
    - Front.png
    - ....

# GenAi – MV-Adapter Text2Texture



- Collecte des données
- Evaluation des données via Benchmark

# GenAi – MV-Adapter Text2Texture



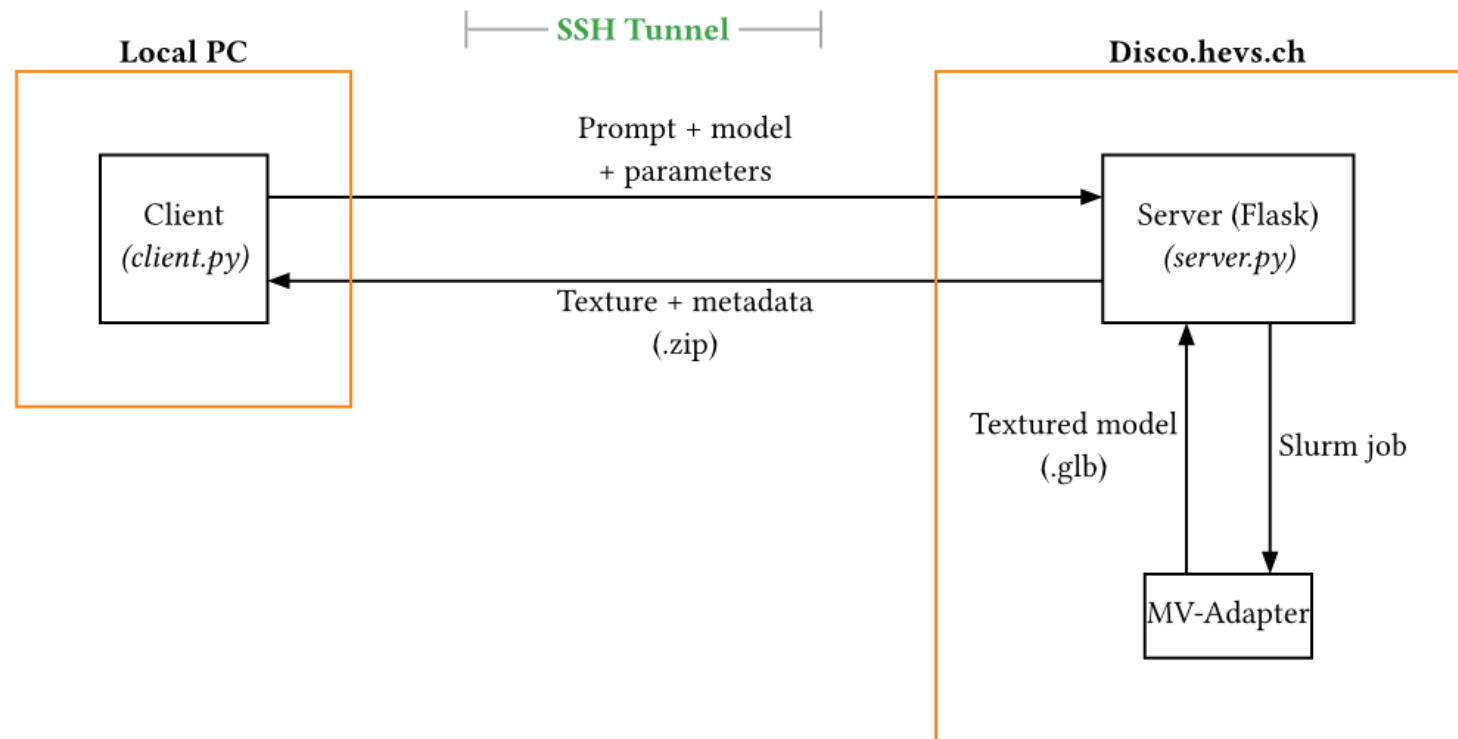
- Evaluation des données de manière automatisée

# GenAi – MV-Adapter Text2Texture

- [Profession Ducks](#)
- [Video games Ducks](#)
- [RPG Ducks](#)
- [Superhero Ducks](#)



# GenAi – Integrated Pipeline



# Tracing

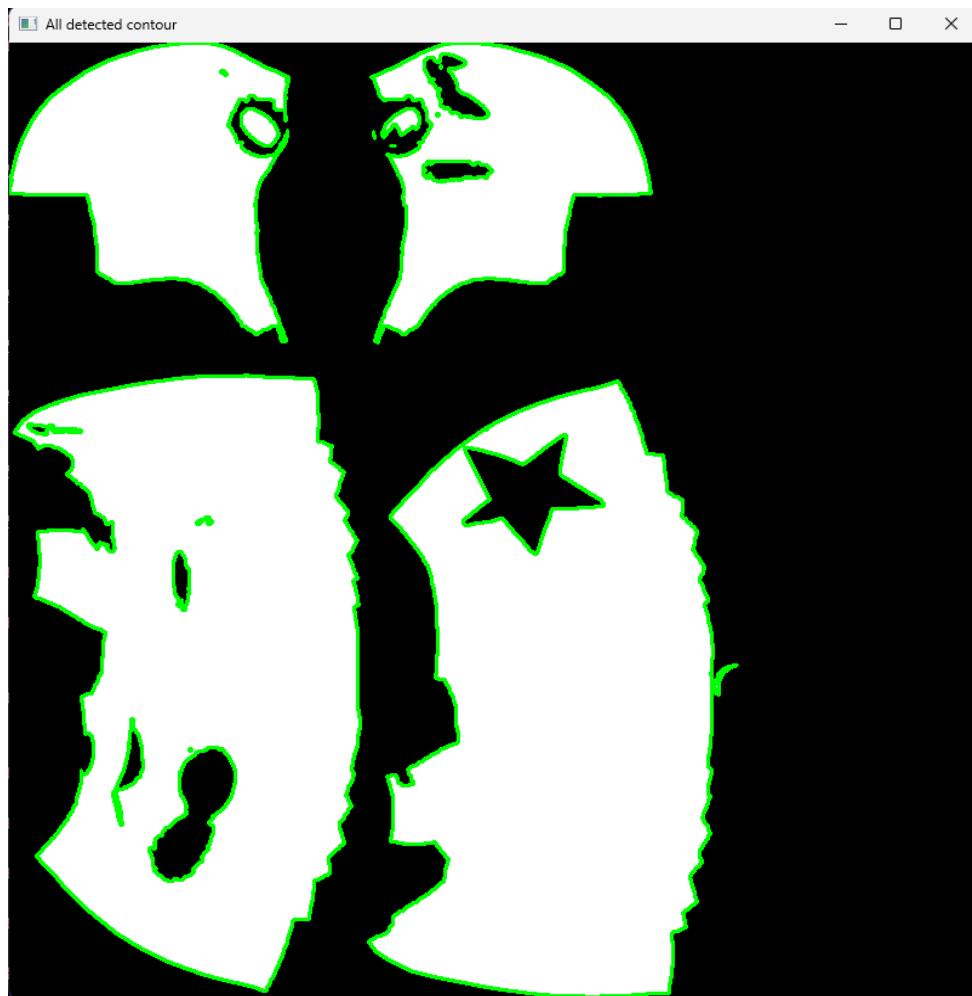
*Identified issues in the pipeline*

- new UV map
- Unreachable areas
- Fill slicing failures
- Trace dataset
- Pipeline stress-testing

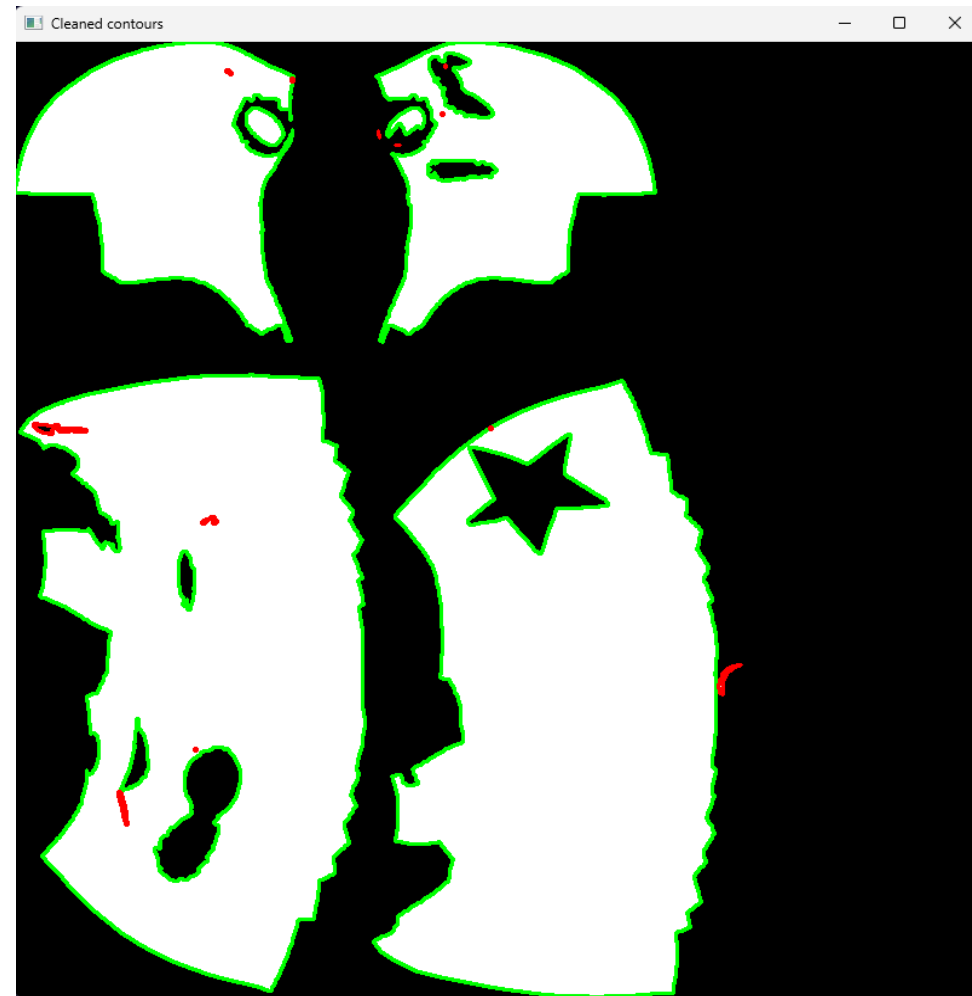


# Tracing

*Small artefacts removal*



*before*



*after*

# Tracing

*Unreachable areas*



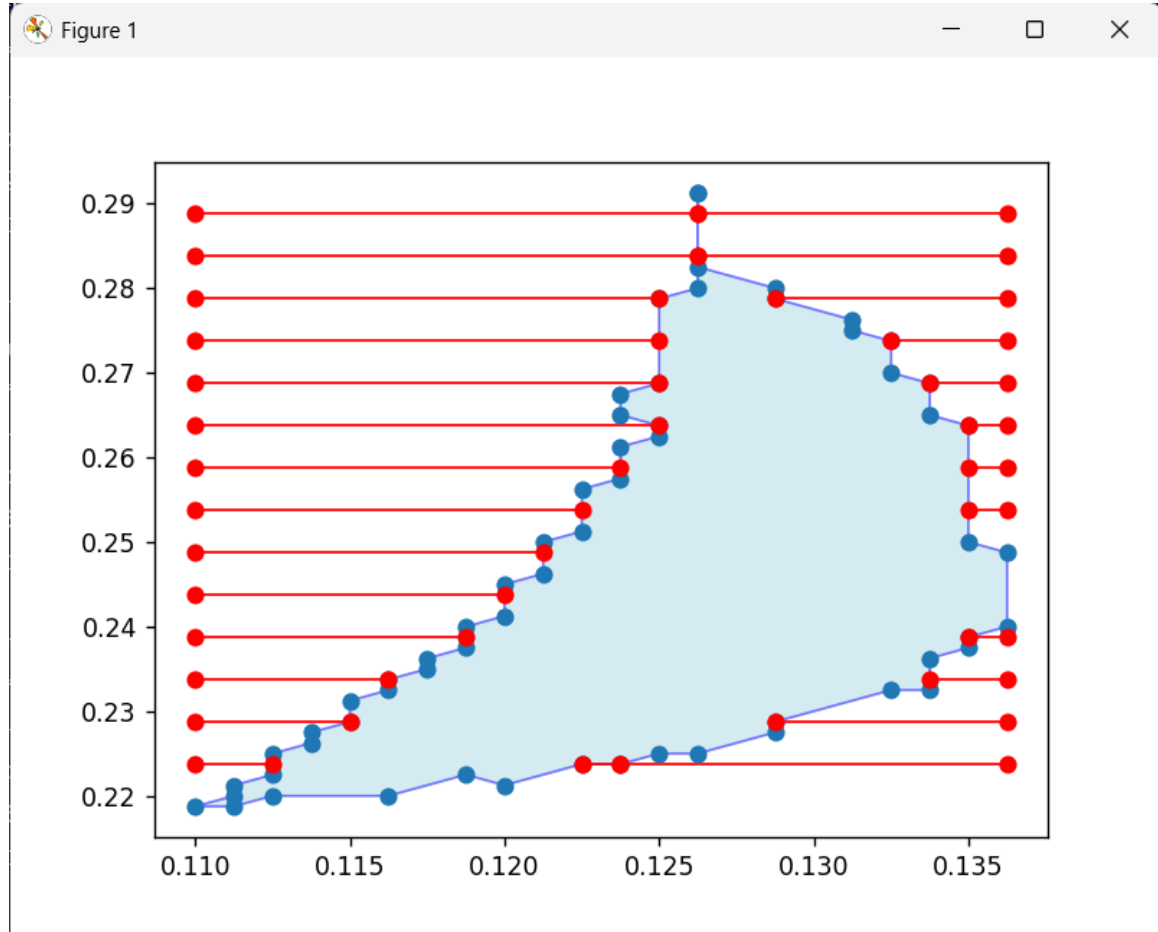
*Steep angles / sharp edges on the eyes*



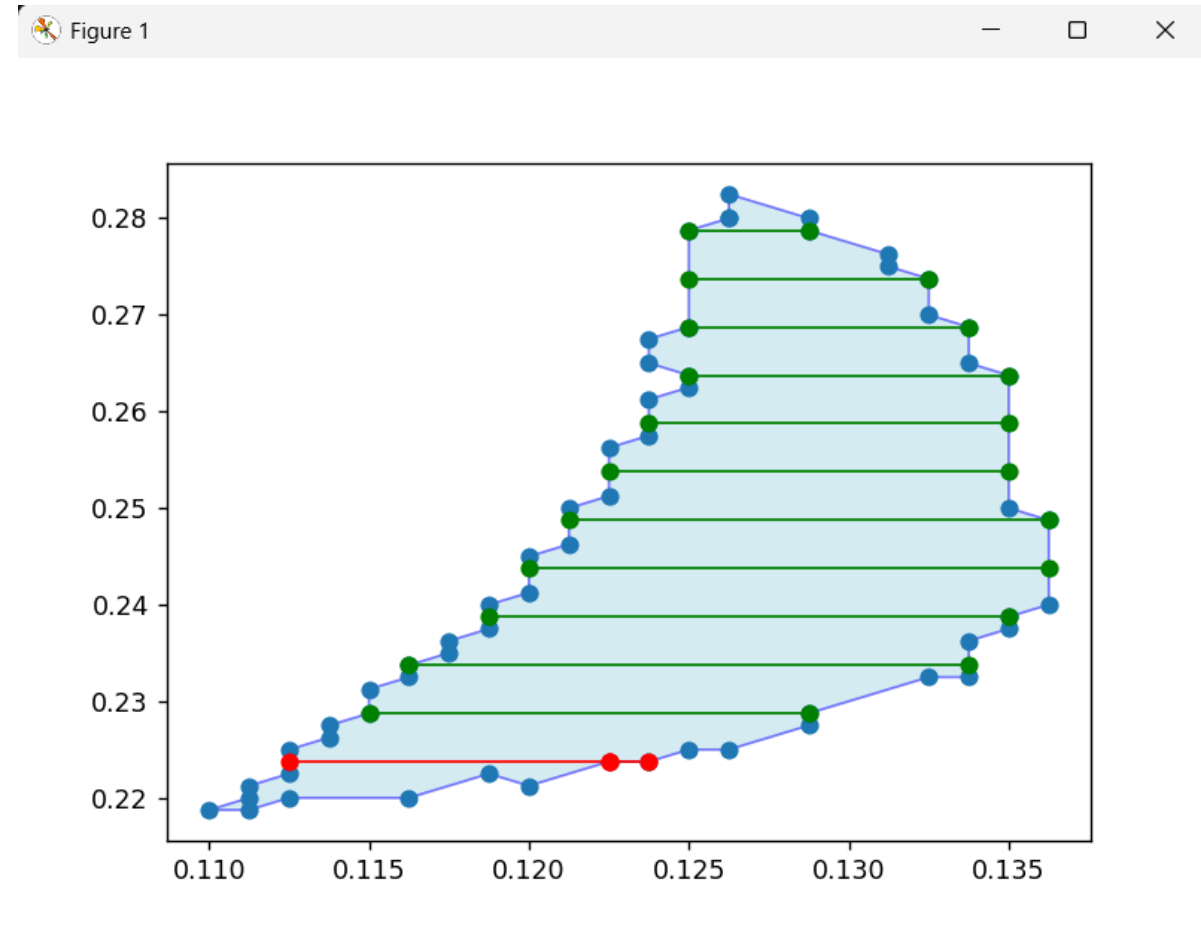
*Drawable areas mask*

# Tracing

## Fill slicing debug



*before*



*after*

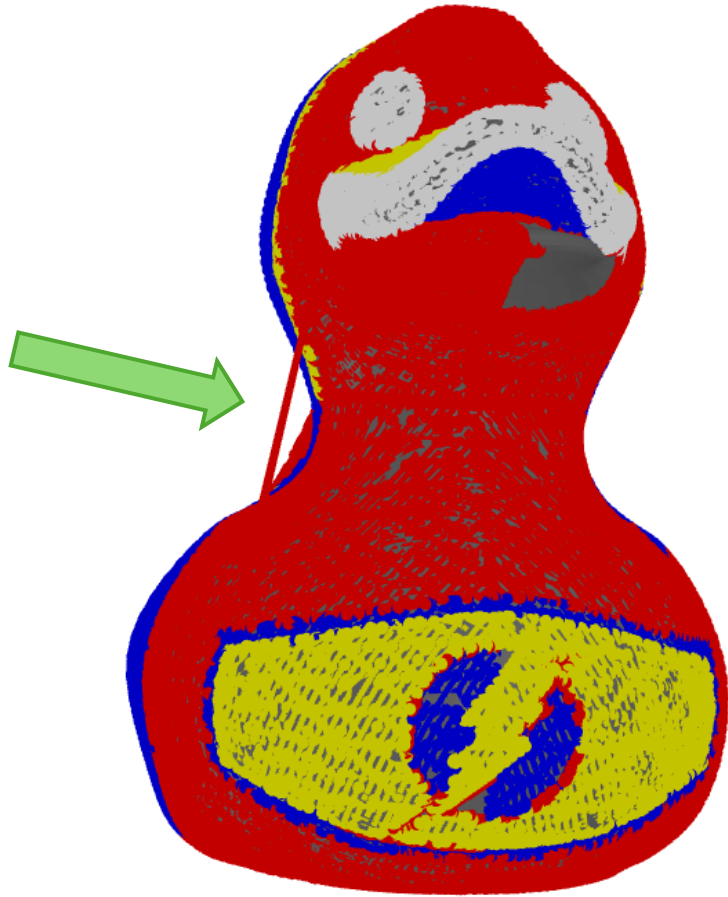
# Tracing

## *Dataset of tests*

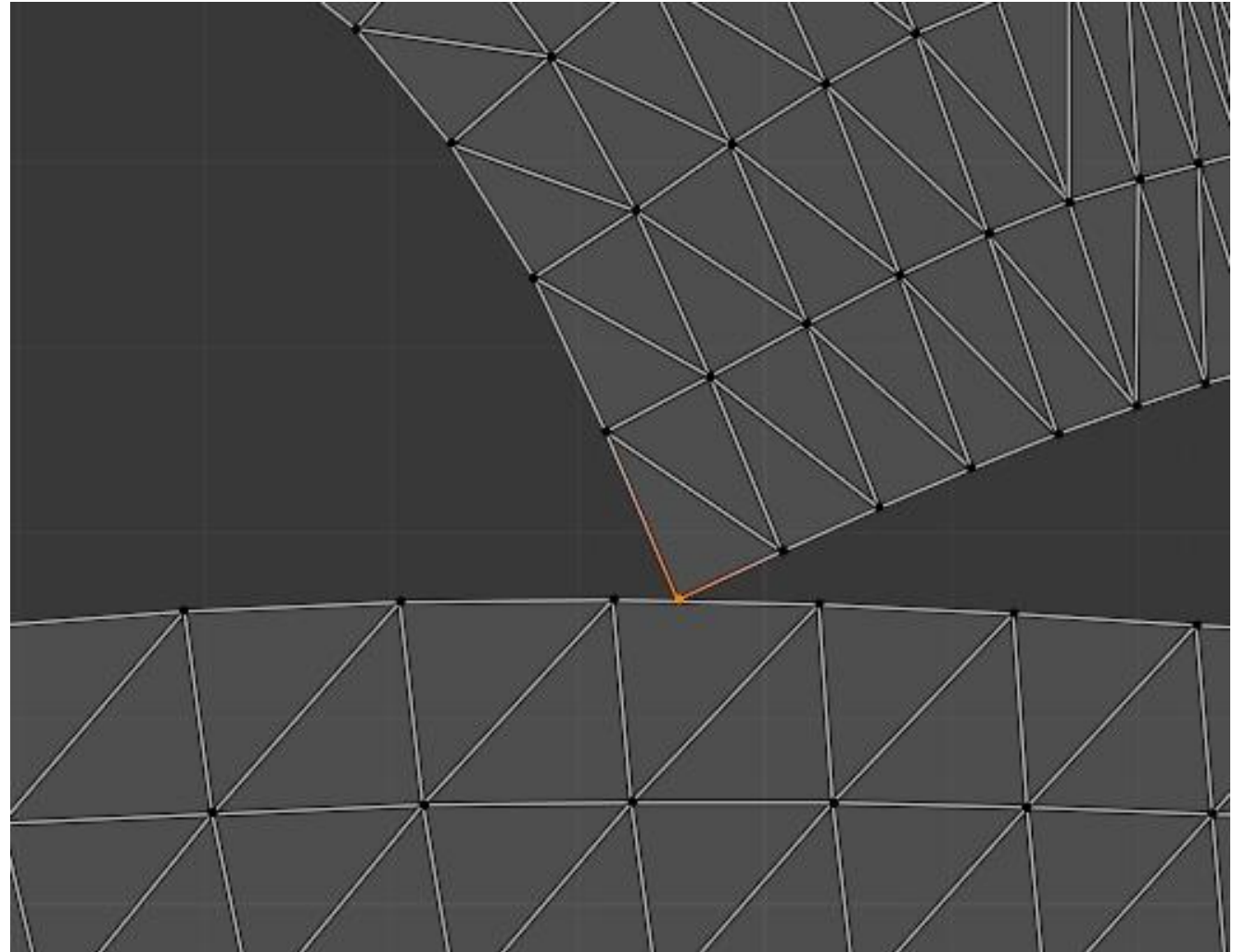
- *Test n.1 : a simple triangle on the right wing*
- *Test n.2 : a simple circle on a the right wing*
- *Test n.3 : a filled circle on a the right wing*
- *Test n.4 : a triangle on top of the bill*
- *Test n.5 : two lines on both sides of the back*
- *Test n.6 : lines on both eyes*
- *Test n.7 : a spiral on the torso*
- *Test n.8 : two circles on the head*
- *Test n.9 : three simple lines, in blue/green/red on the left wing*
- *Test n.10 : a line wandering around all the duck*

# Tracing

*Cross UV island segment*



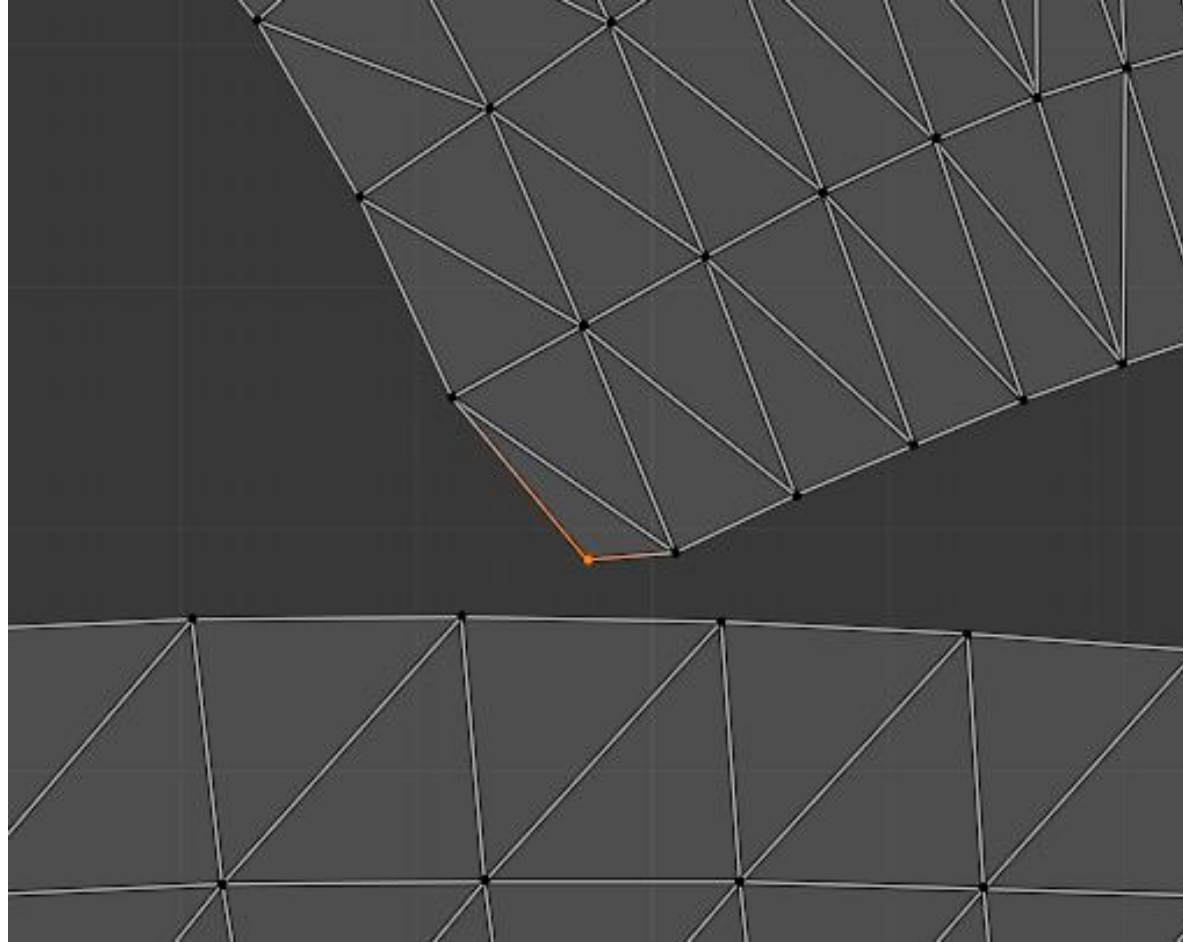
*Sample result with jumping segment*



*Site of error on the UV map*

# Tracing

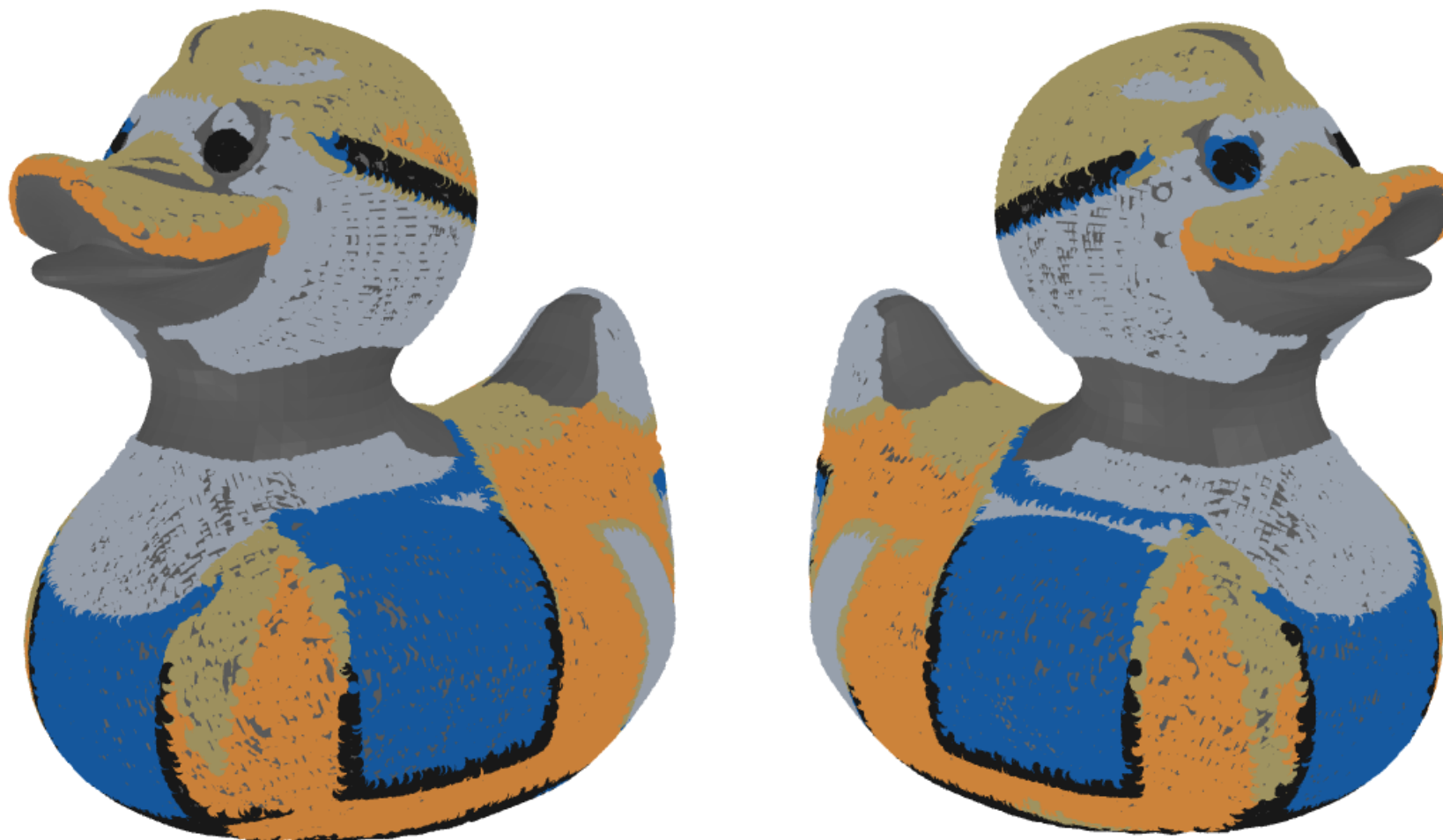
*Cross UV island segment*



*Possible workaround*

# Tracing

## Results

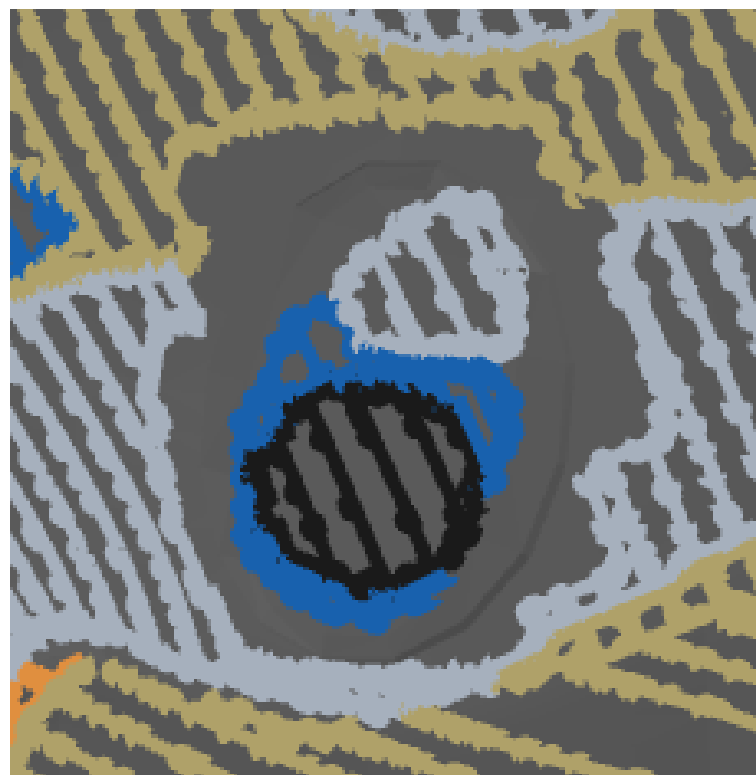
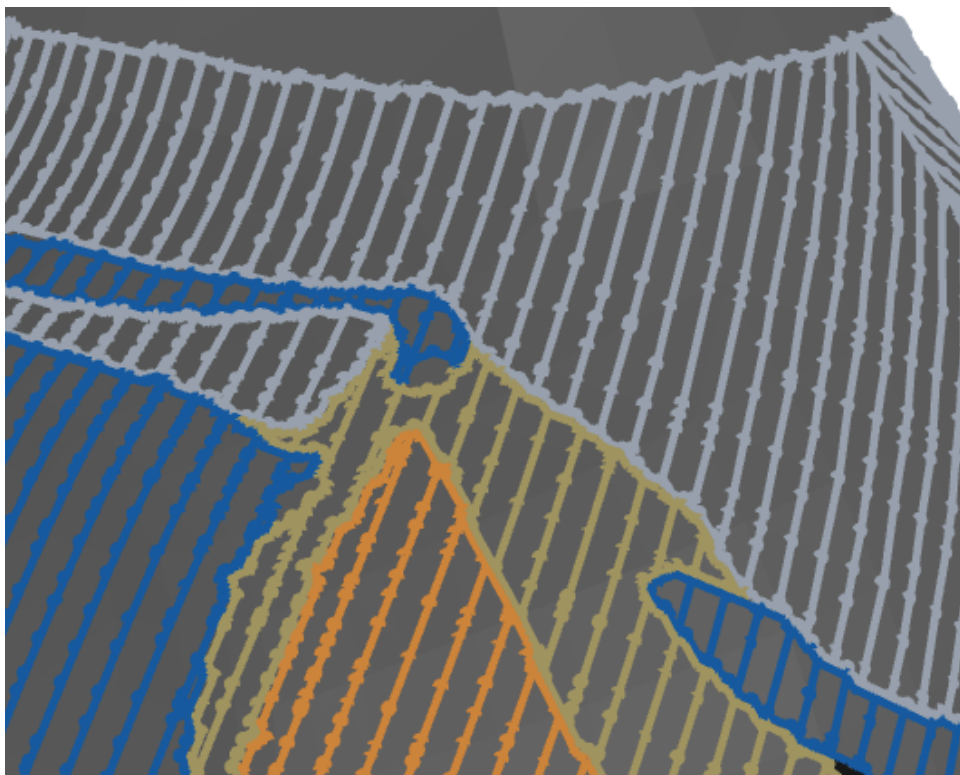


*Current results with an AI generated texture  
(construction worker)*

\*7m30

# Tracing

## Results



*Current results with an AI generated texture  
(construction worker)*

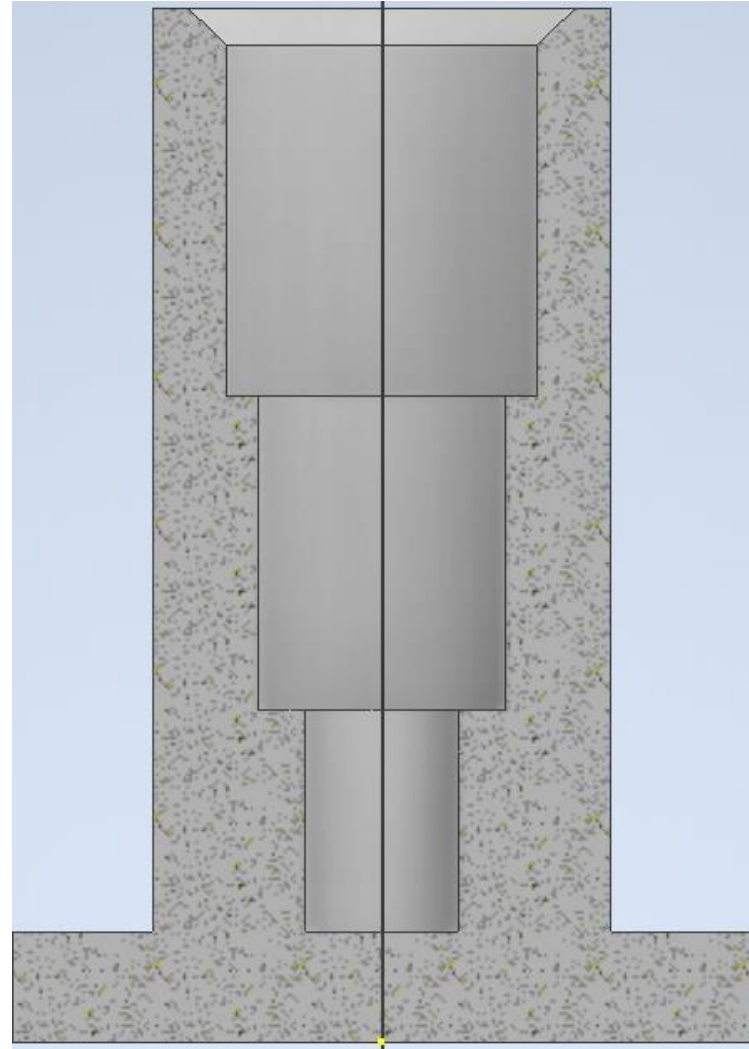
# 3D Printing

- Fix friction effect
- Add spring for gripper consistency
- Fix the stability of the duck support
  - Tape solution not efficient
  - Considered less important than other tasks



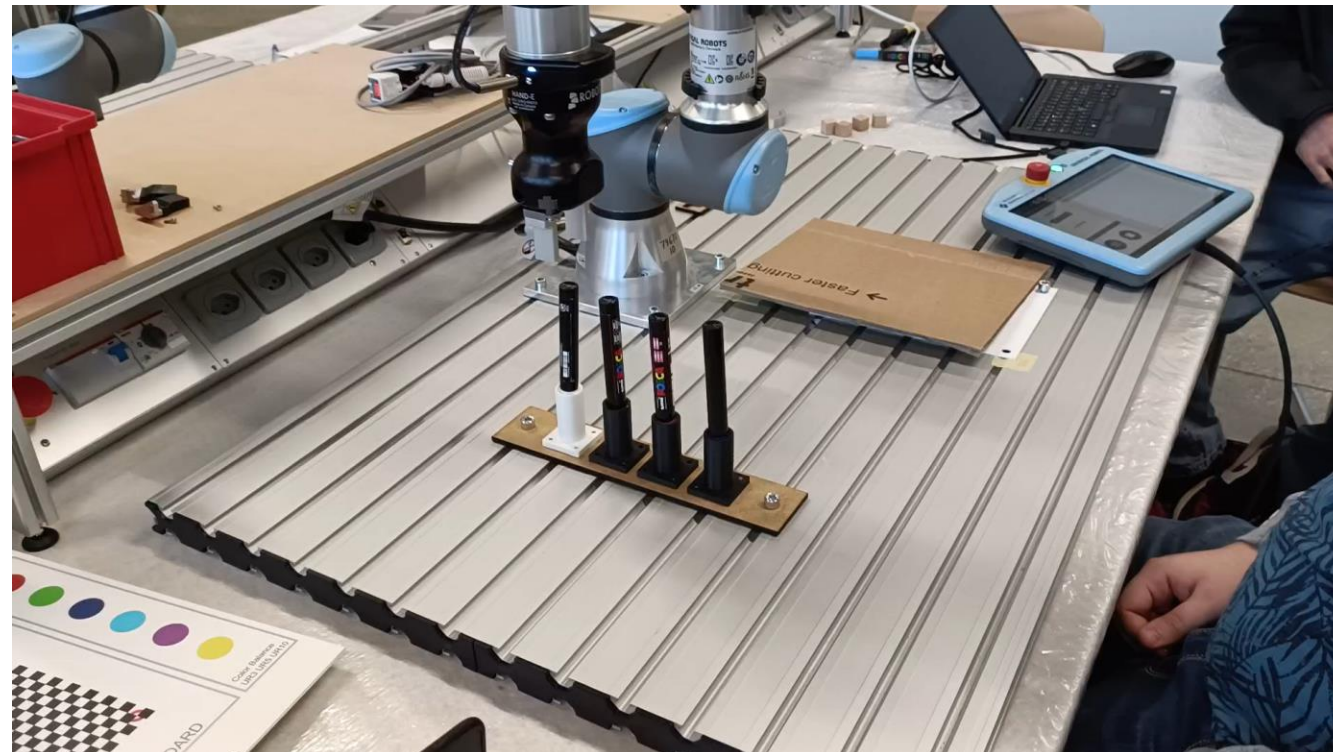
# 3D Printing

- Our support design



# Robot

- Pen transition program



# Robot

- Integration of pen program in the pipeline
  - Work in progress



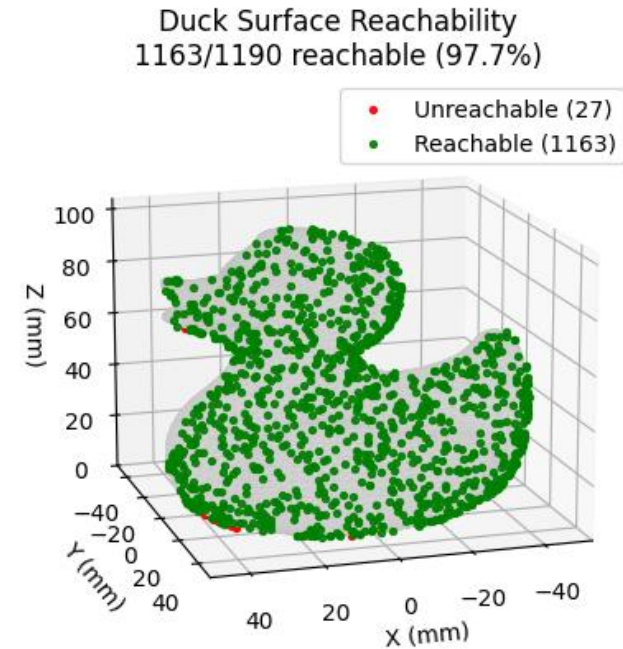
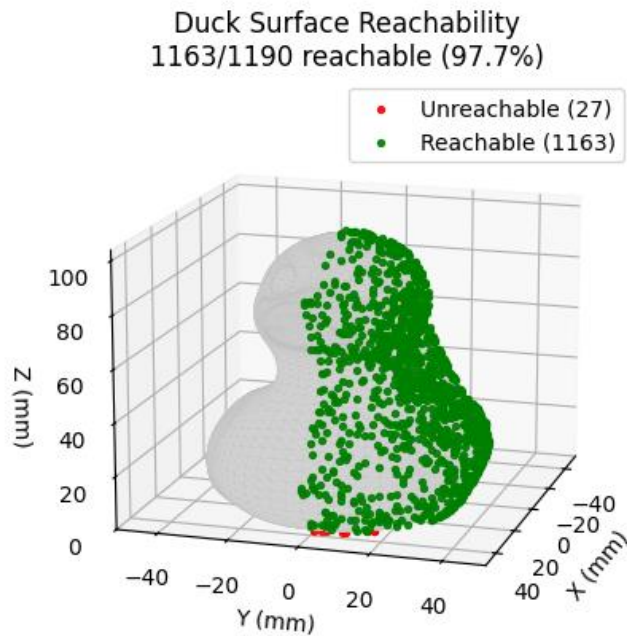
# Robot

- Correction safety PyBullet
- Draw on a 3D surface
  
- Draw with 2 pens



# Robot

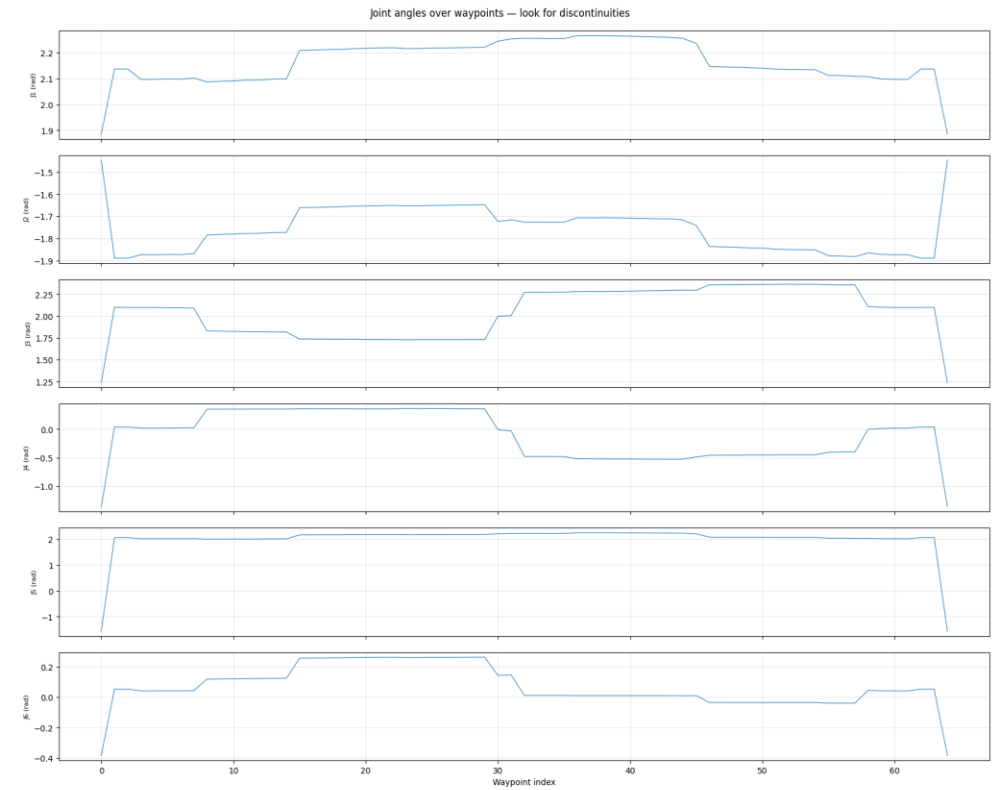
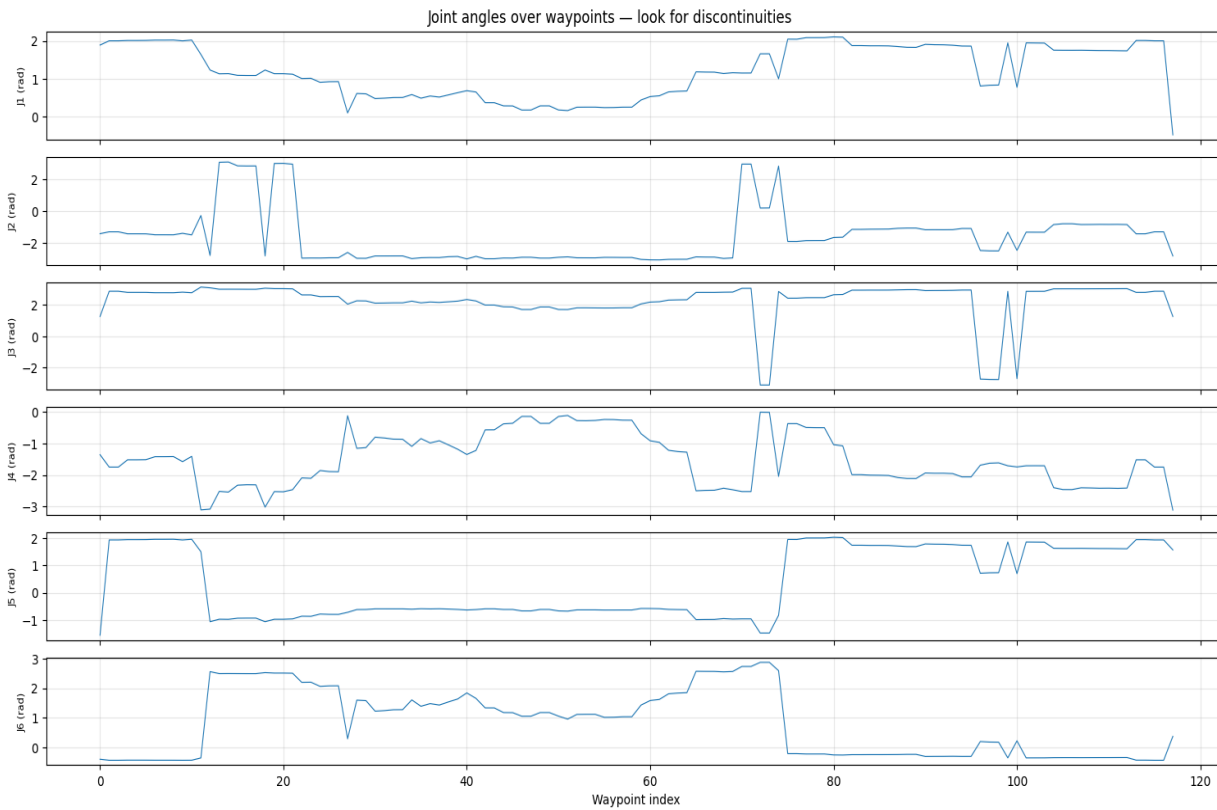
- Left-Right traces separation for reachability purpose
- Will have to turn the duck 180d manually



# Robot

Path optimisation: smoothing the joints movement to avoid robot self-collision

- re-pathing with qnear
- pybullet\_planning

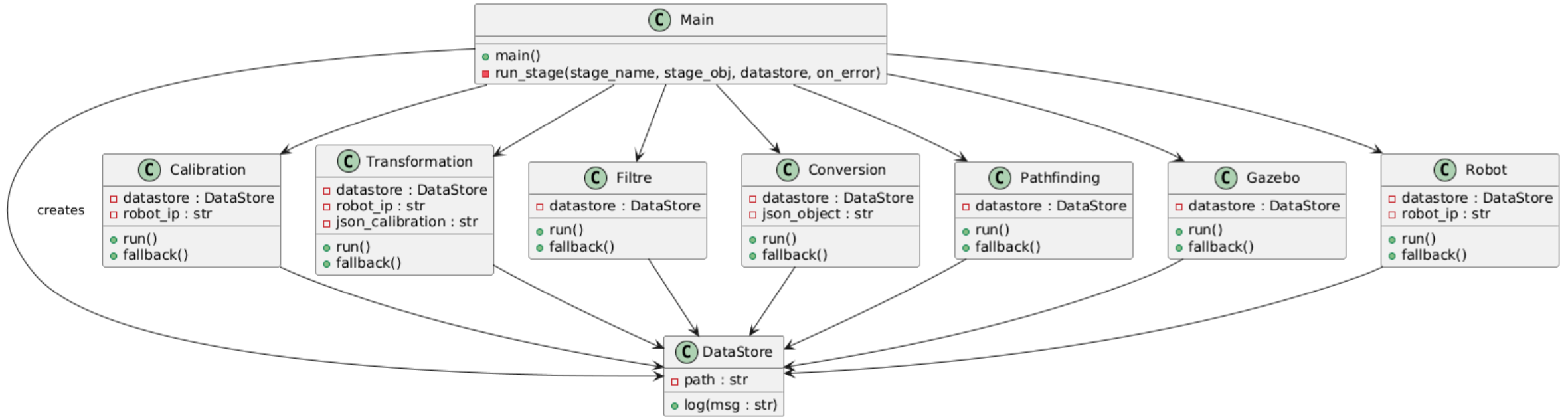


# Robot



# Robot

Robot Pipeline - Full Class Diagram



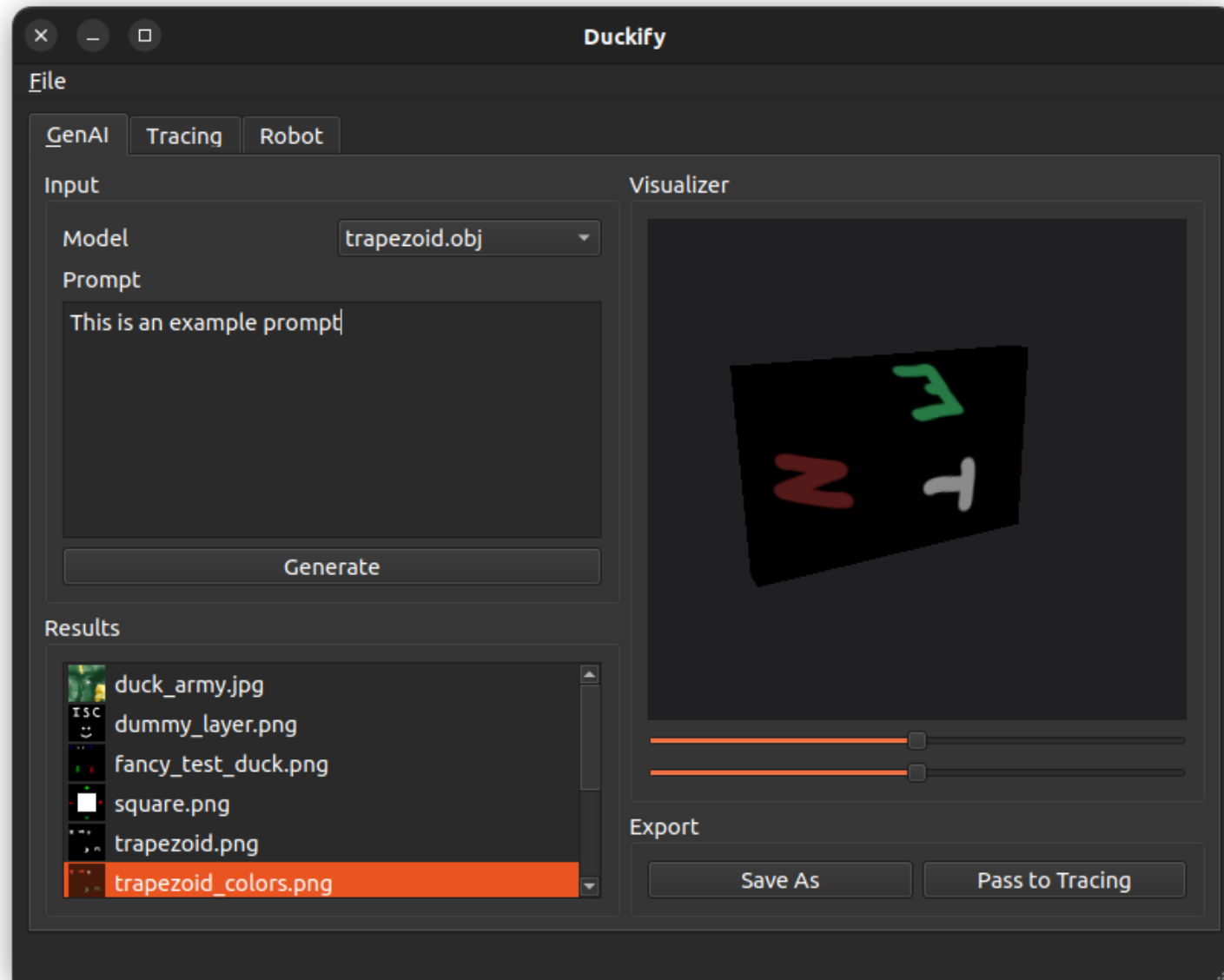
# UI

**Goal:** Configuration, execution and overview of all steps of the pipeline

**UI**

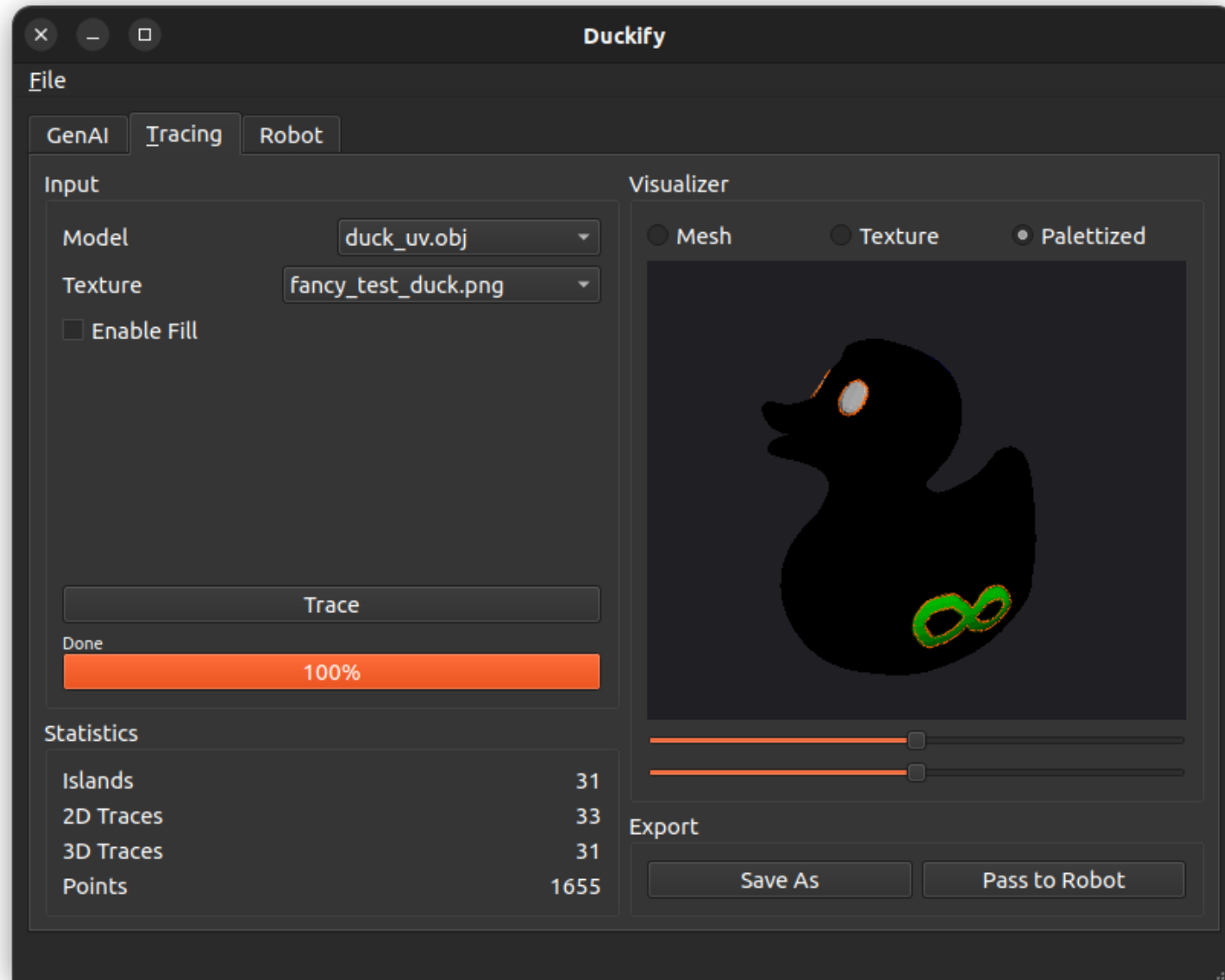
**Demo**

# UI



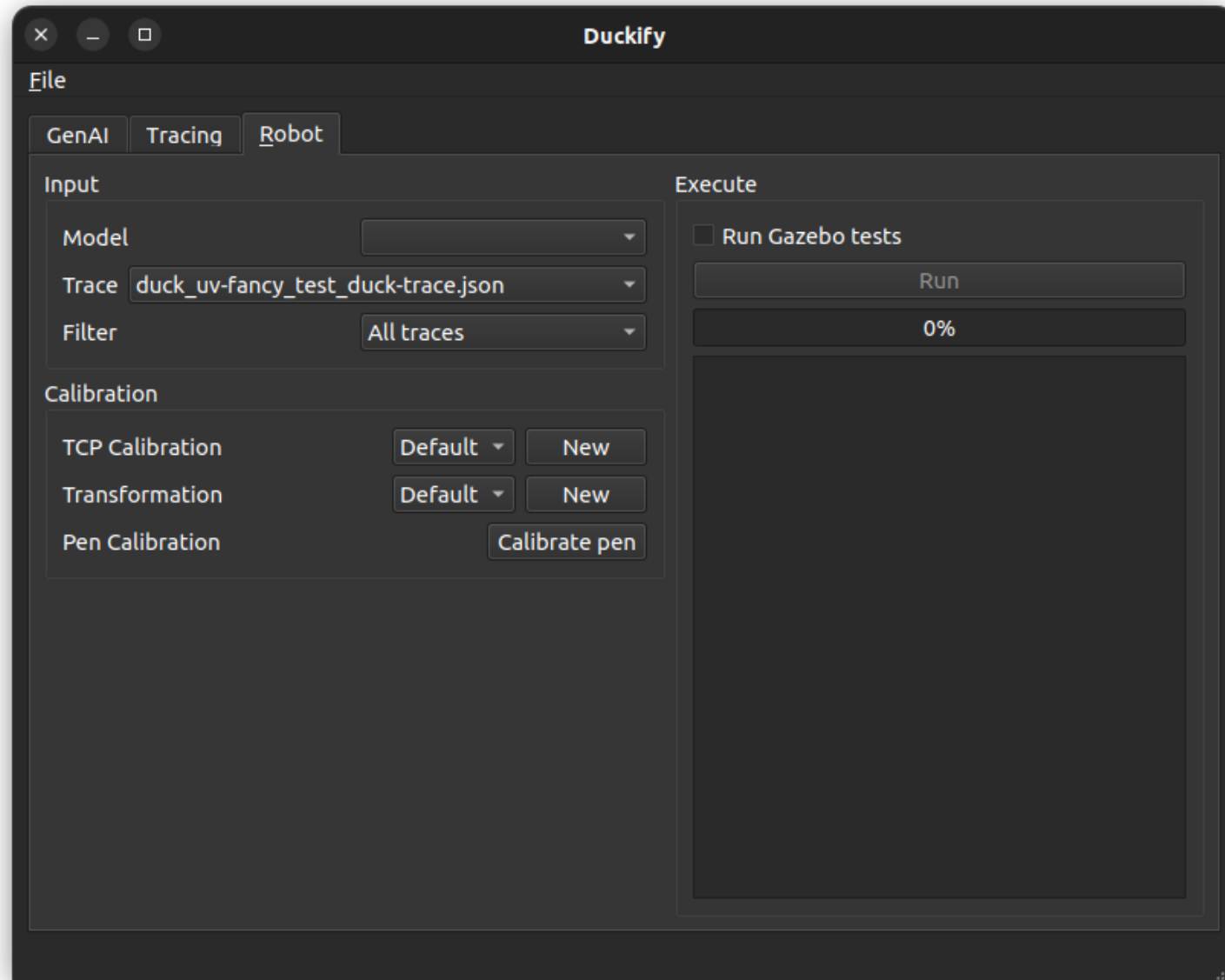
*Main window, GenAI tab*

# UI



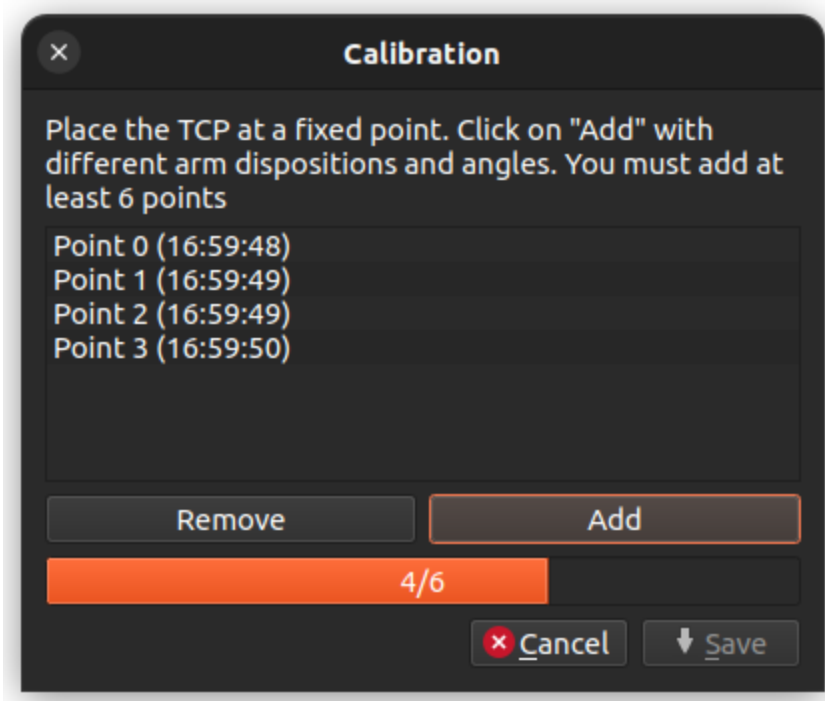
*Main window, Tracing tab*

# UI

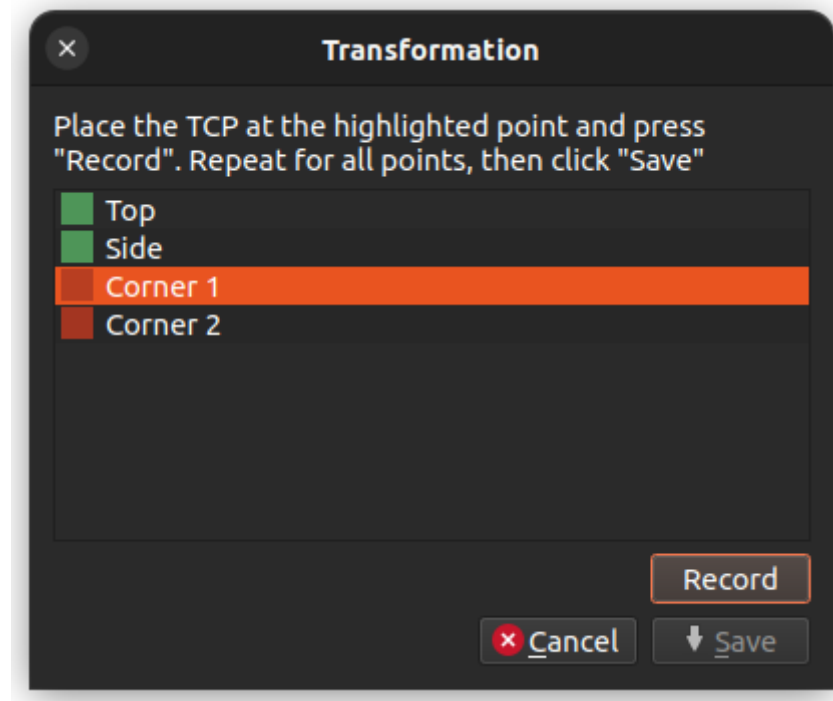


*Main window, Robot tab*

# UI

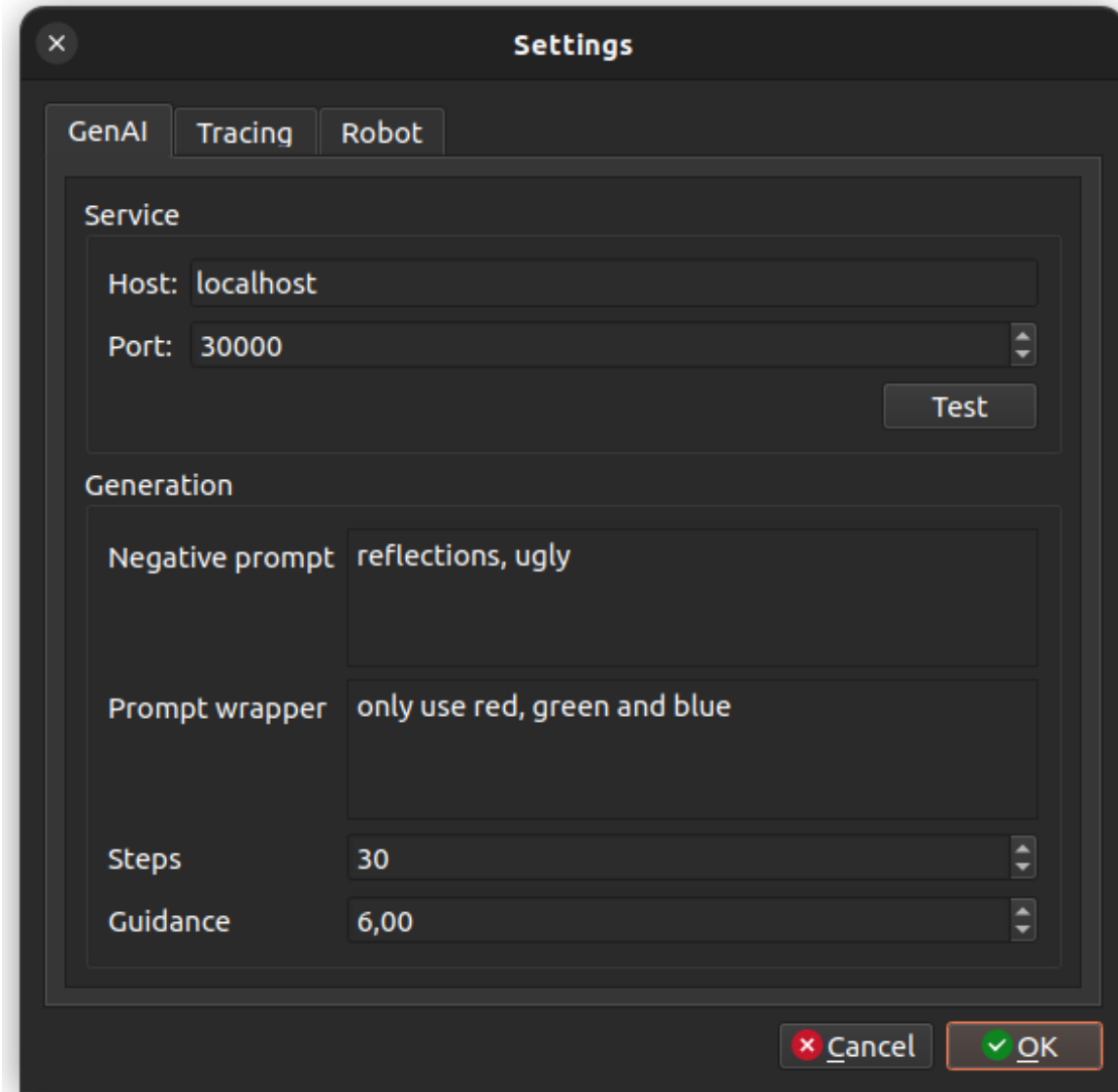


*Calibration dialog*



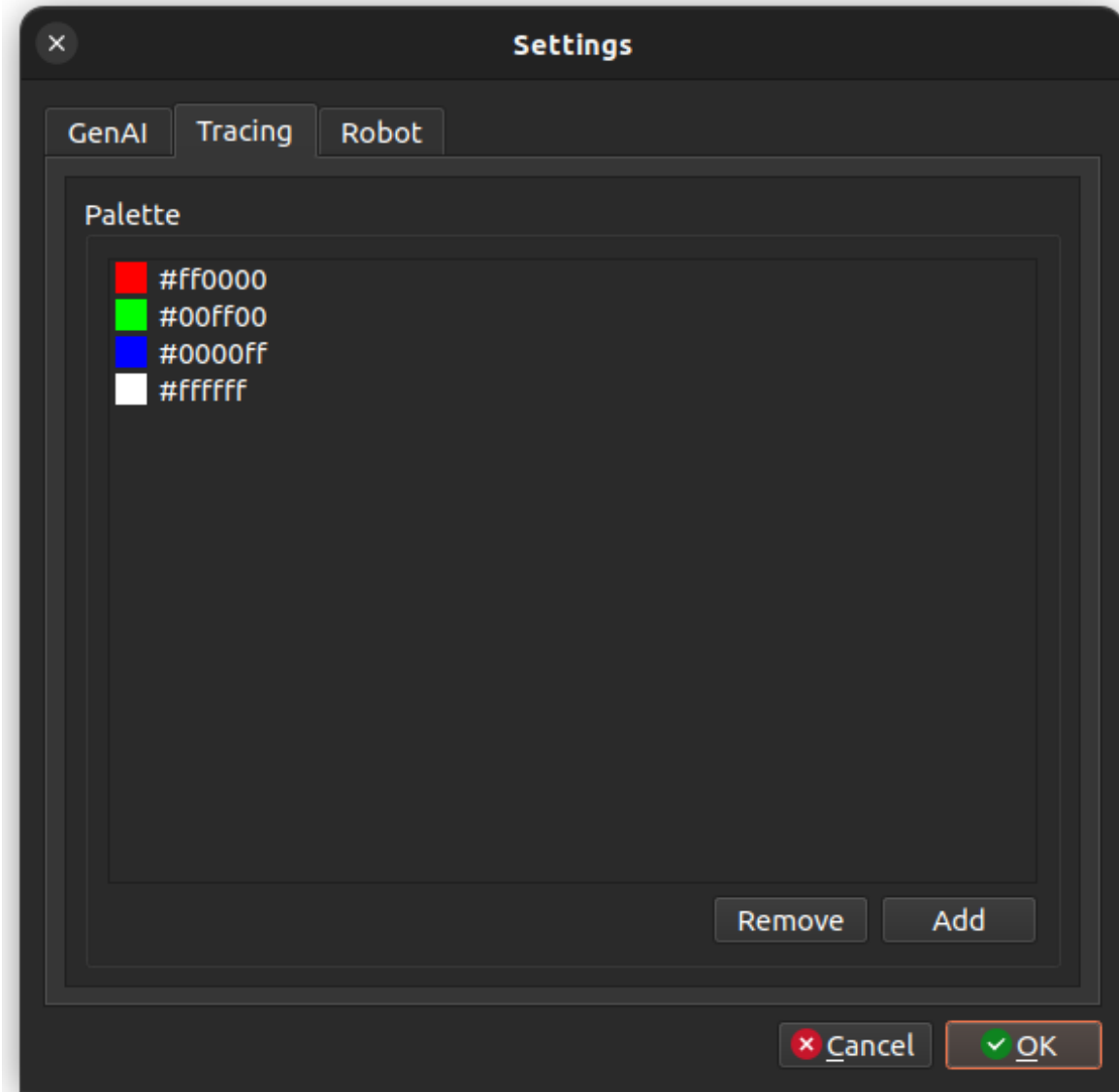
*Transformation dialog*

# UI



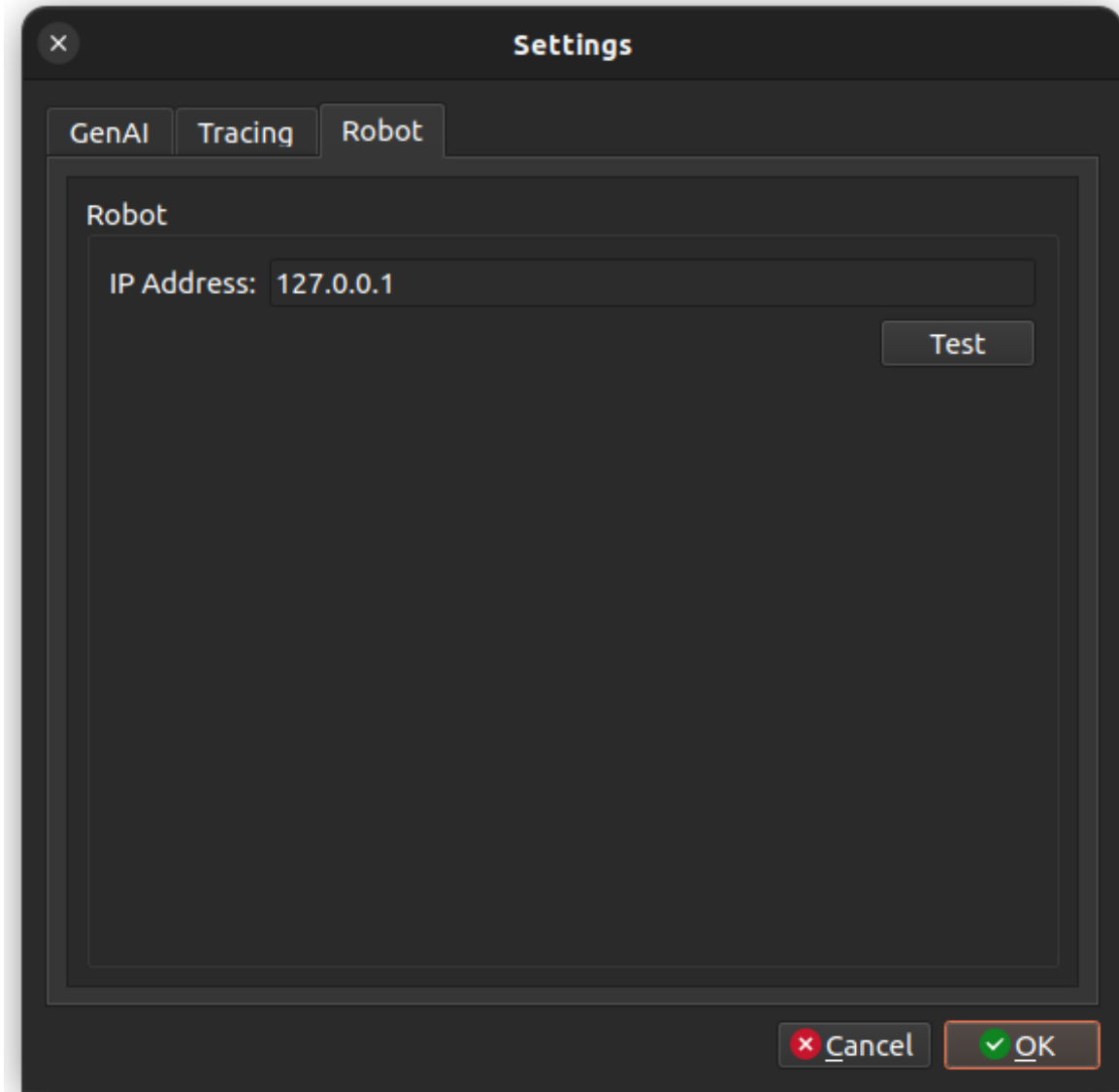
*Settings window, GenAI tab*

# UI



*Settings window, Tracing tab*

# UI



*Settings window, Robot tab*

# Milestone

*For the week 6*

Using the **complete pipeline**, starting from an **orchestration interface**, draw **AI-generated contours**, on a duck using **multiple colors with automatical changes**.

Have a **promoting** website for the project