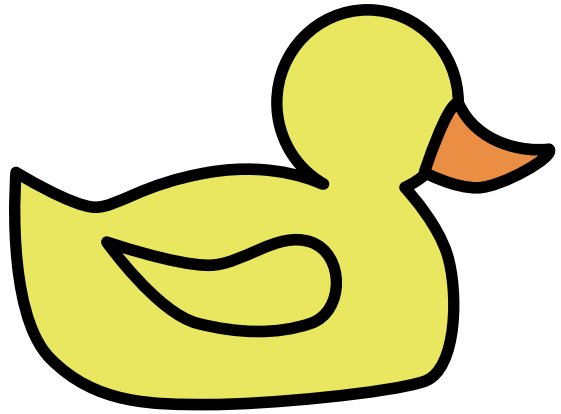
Duckify

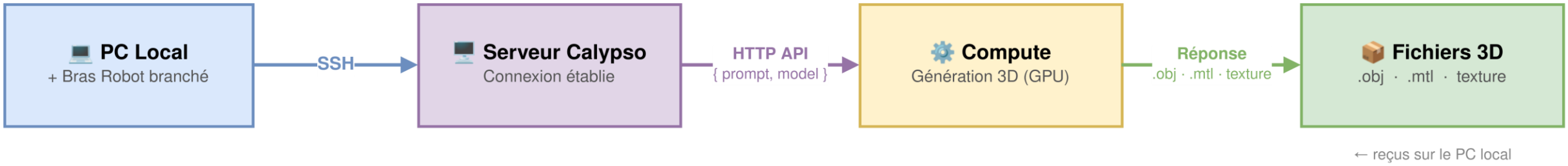
Second weekly review



LLM et Design

- **Milestones planned for this week 2 :**
  - Assess generative model limits: prompt fidelity, instructions following (output format/shape) ❌
  - Integrate a working workflow into the general pipeline ✅

LLM et Design



LLM et Design – Text2Texture

«Un canard rouge bleu et blanc»

«Un canard noir»

«Un canard Manga »

LLM et Design – Image 2 Texture

LLM et Design

- Conclusion
  - Disco & Chacha : Complexité de temps trop haute + trop cher
  - Beaucoup d'essais d'investiguation de solutions -> perte de temps
  - Recherche via google scholar -> peu de solutions probantes
  - Pipeline d'integration globale fonctionnelle

Tracing

Milestones planned for this week 2 :

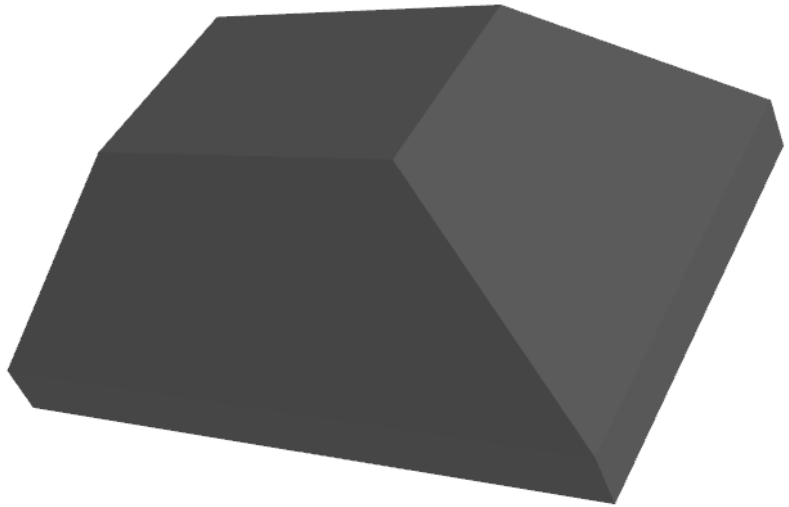
- 1st complete Pipeline (from texture/.obj to 3D drawing segments) 
- Define performance evaluation criteria 
  - Blockers:
    - Time
    - Will to finish 1st the pipeline to have insights

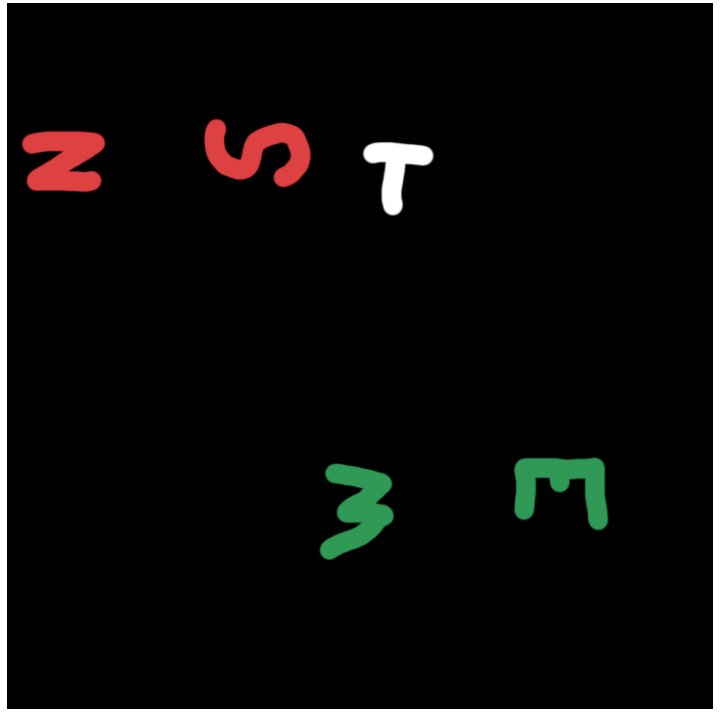
Tracing

About the pipeline...

Step 1 : load model and texture

Texture & model are received from the GenAI part



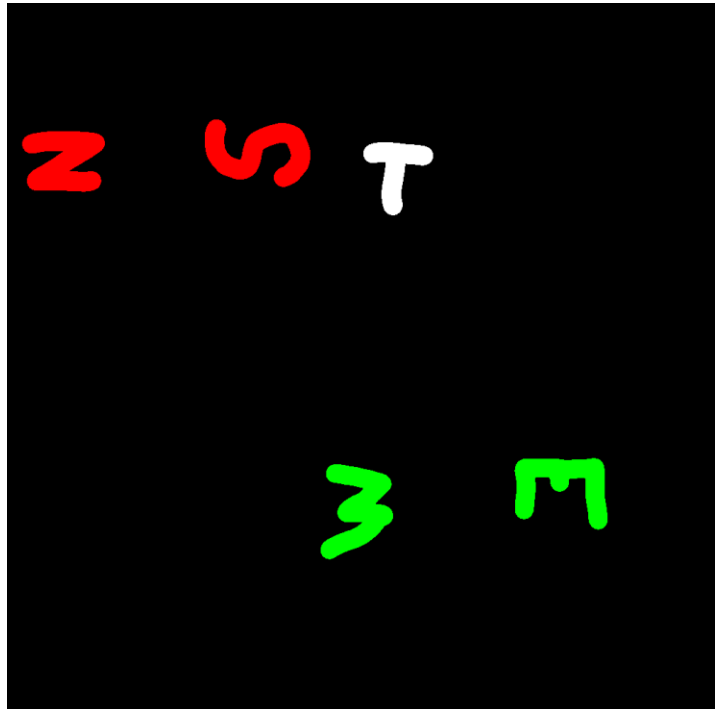


Tracing

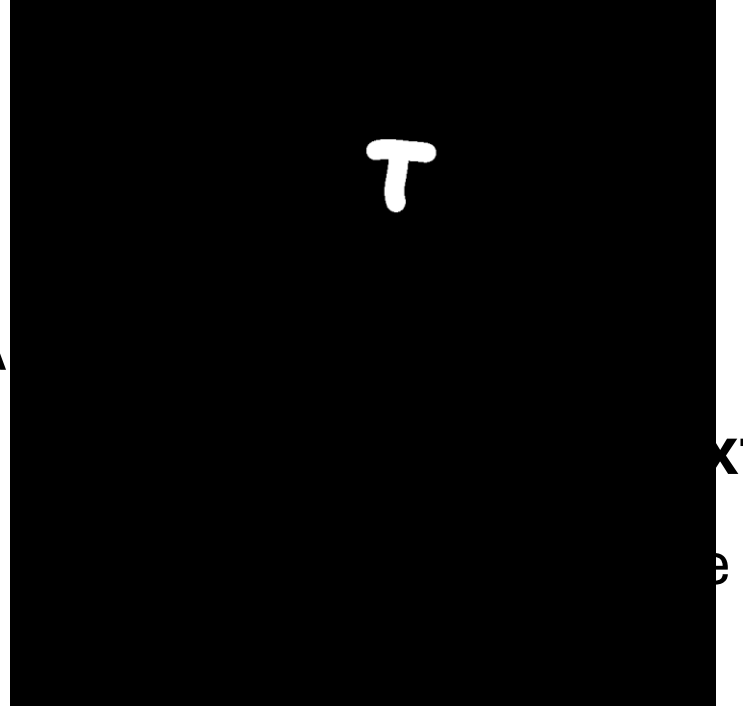
About the pipeline...

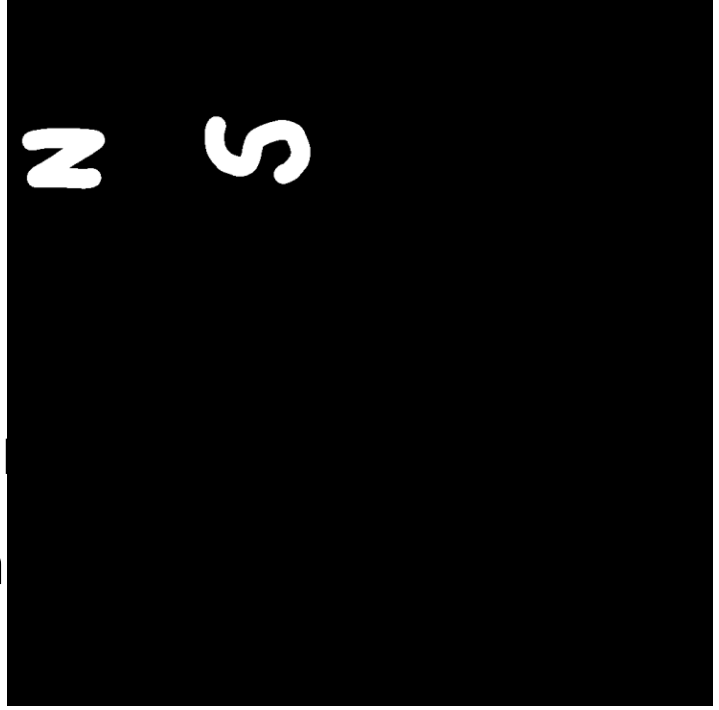
Step 2 : palettize texture

To reduce colors to the one available by the robot



- **TODO :**
  - improve the visual results





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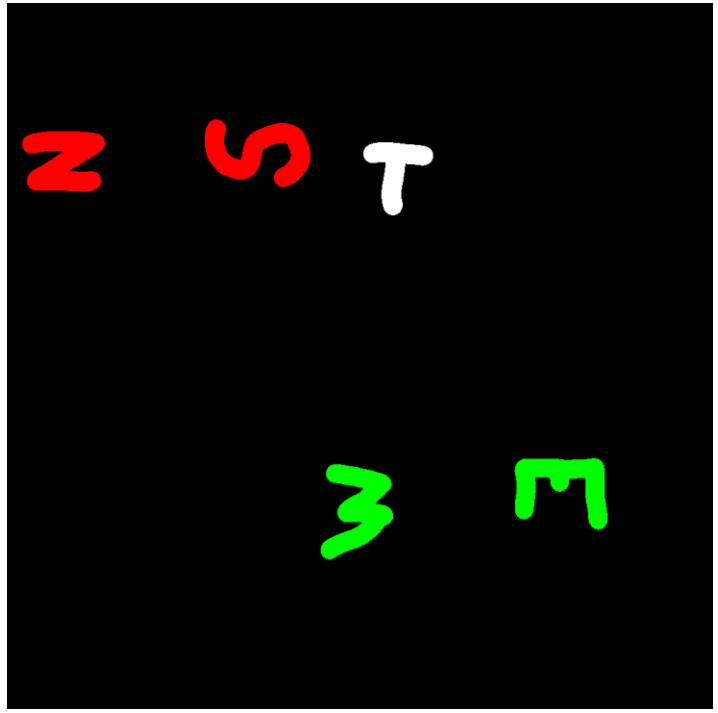


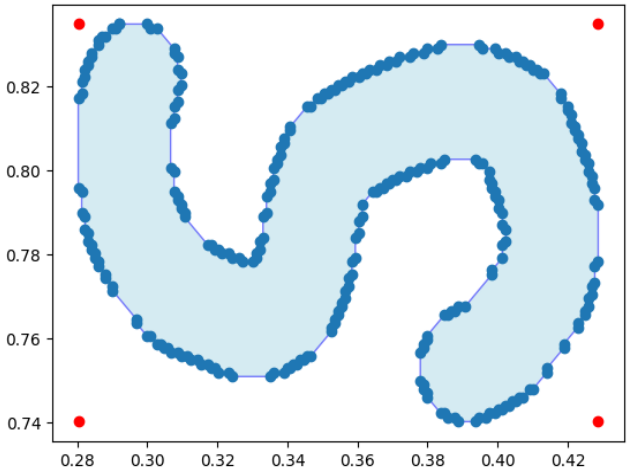
- **TODO :**
  - improve the

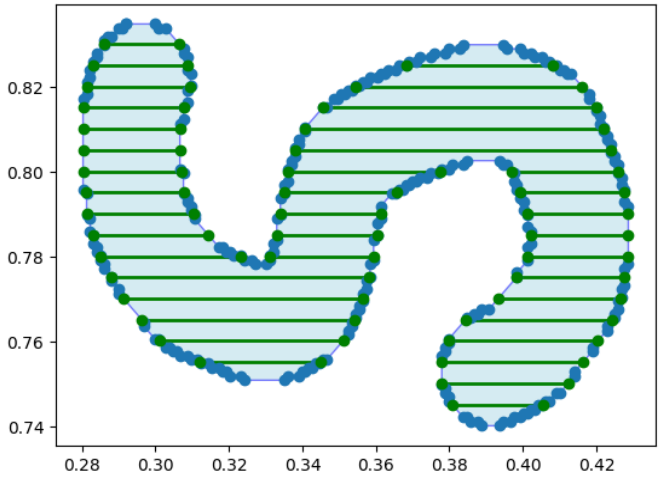
Tracing

About the pipeline...

Step 3 : from island to border and fill coordinates

Getting the segments corresponding to island's border and filling





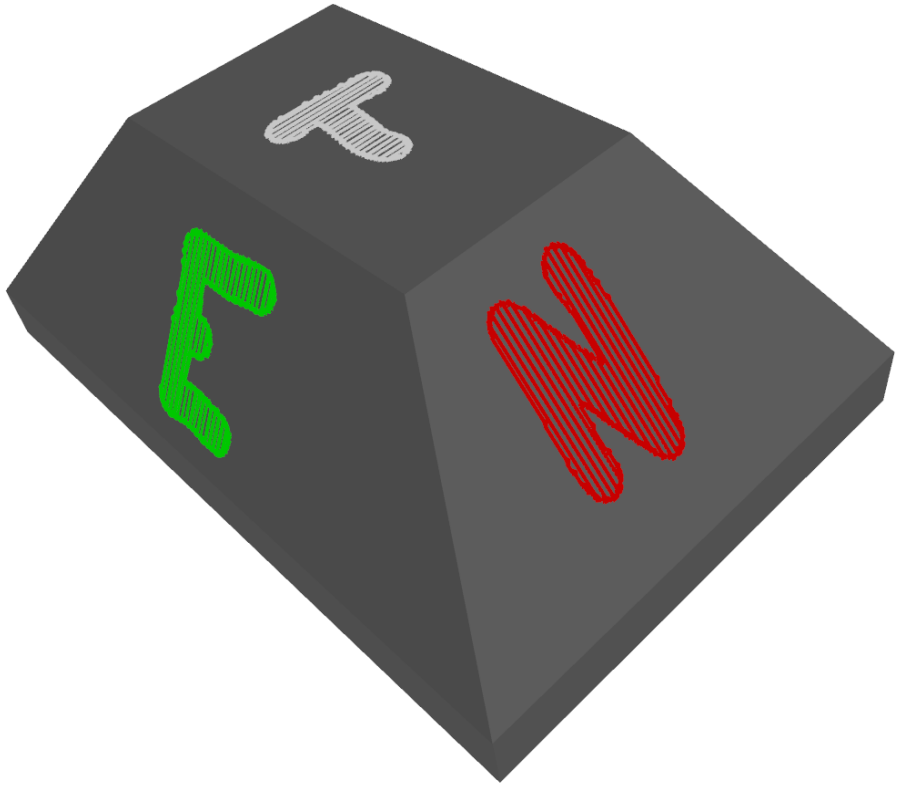
- **TODO :**
  - Improve concentric border of island
  - Improve border resampling
  - Improve fill patterns and resampling

Tracing

About the pipeline...

Step 4: 3D projection to get traces

Get the 3D projected coordinates of the paths of lines to draw



- **TODO :**
  - Handle cross-face

Tracing

About the pipeline...

Step 5: export traces

Outputs to be used by team robot

Tracing

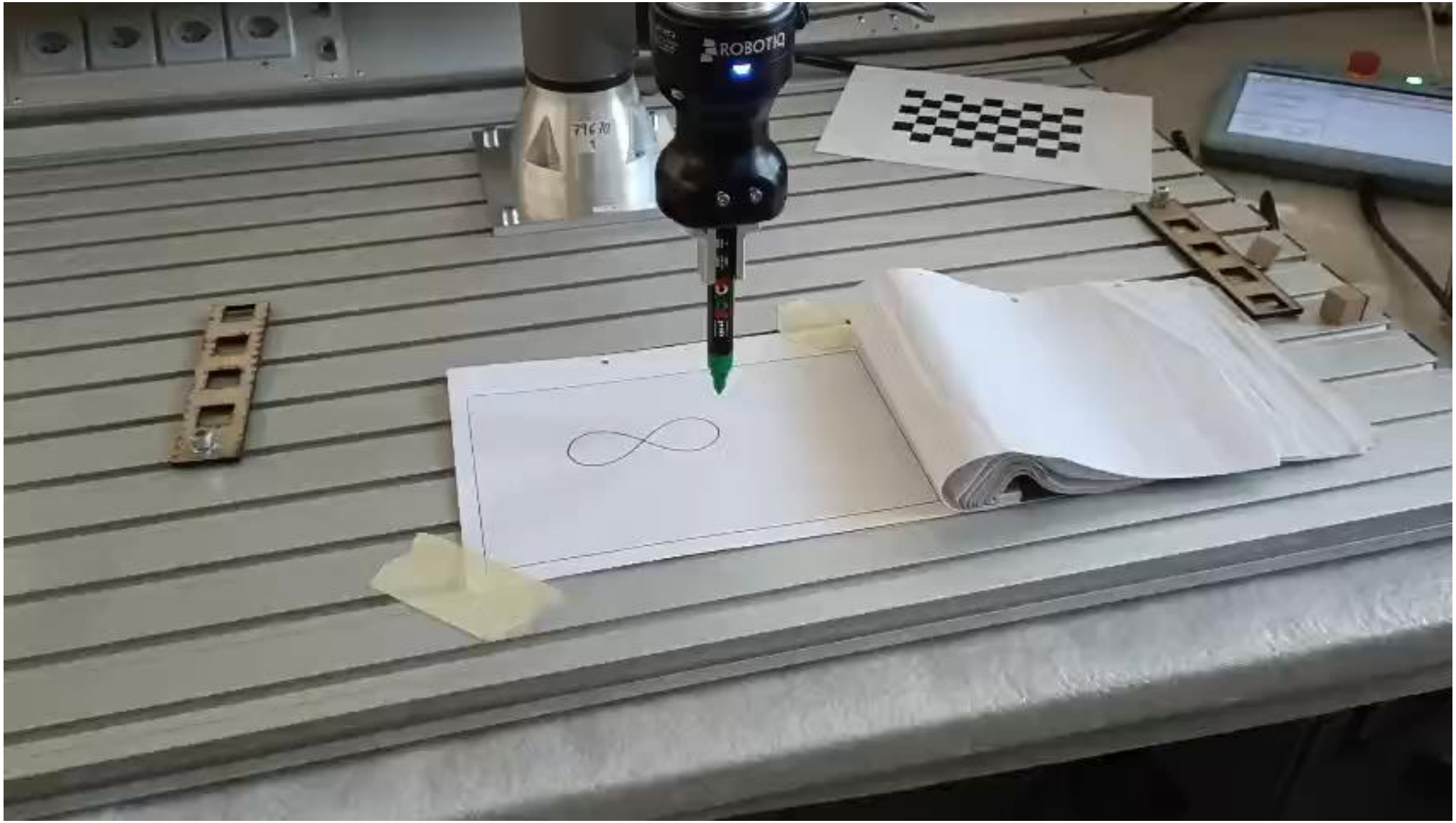
To conclude this week

- New challenges have emerged
- Ready to integrate
- On track with general planification

Robot

- **Milestones planned for week 2 :**
  - Assess pen gripping constraint: Pen selected
  - Draw line on a 2D plane: Draw on a paper
  - Validate TCP calibration: Visual validation
  - Be able to know if a motion of the robot will cause a collision with object

  - Conversion from world coordinate to TCP position (relative at the object)
  - Can catch and manipulate tools (pens)
  - Draw on a 3D surface (plane)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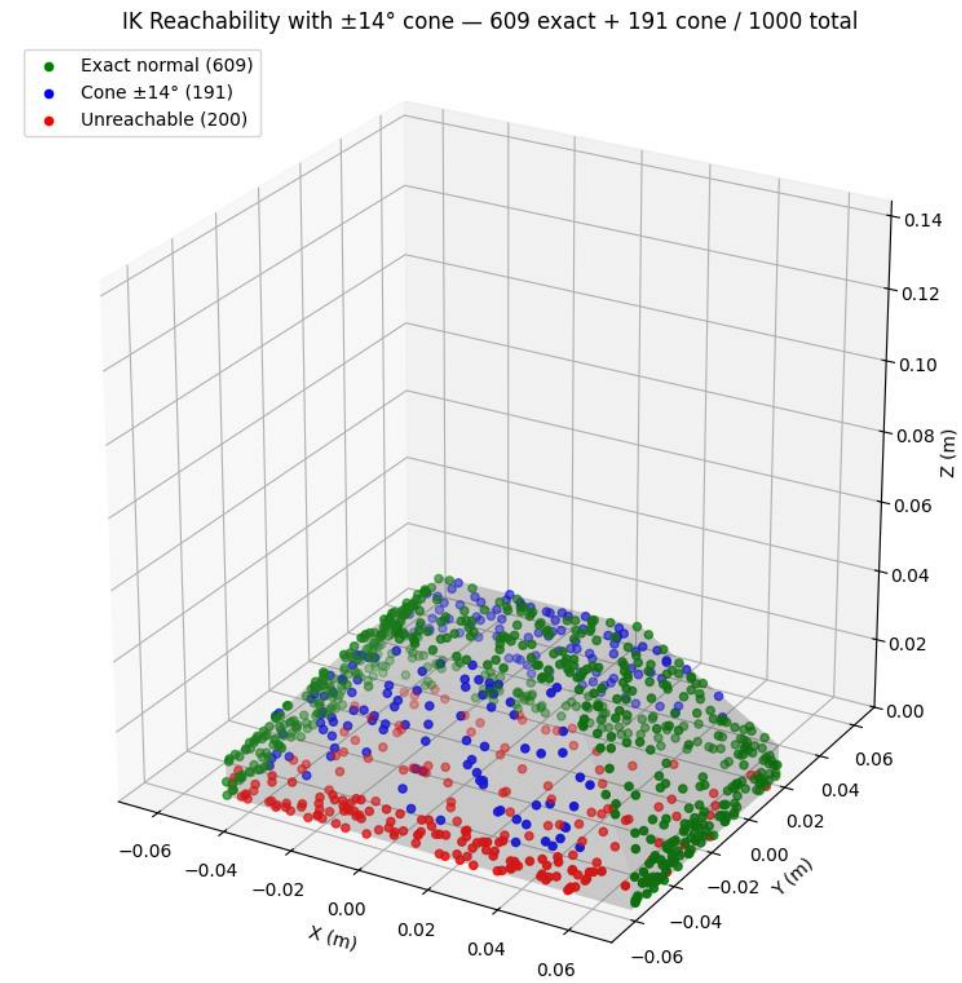

IK Reachability with ±14° cone — 609 exact + 191 cone / 1000 total
Exact normal (609)
Cone ±14° (191)
Unreachable (200)
X (m)
Y (m)
Z (m)
Azimuth
−60
Elevation
25

Robot

- **Issue week 2 :**
  - Some communication problem intern at the team robot
  - Integration between teams a bit slow
  - Organization time with the robot

Impression 3D

Milestones planned for this week 2 :

- Duck supports are printed ❌
  - Blocker
    - No validation from expert yet
- Print base duck model ❌
  - Blocker
    - Model refused by CEO need to wait his feedback to choose one

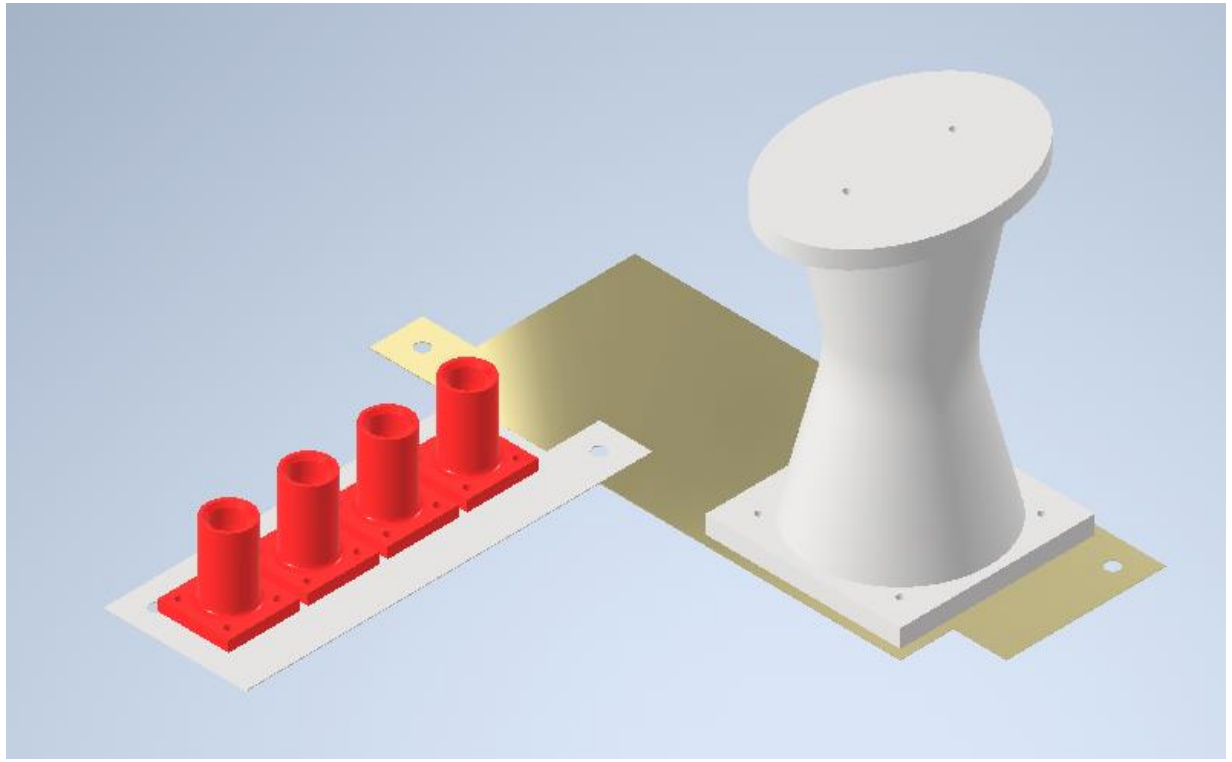
Impression 3D

Milestones planned for this week 2 :

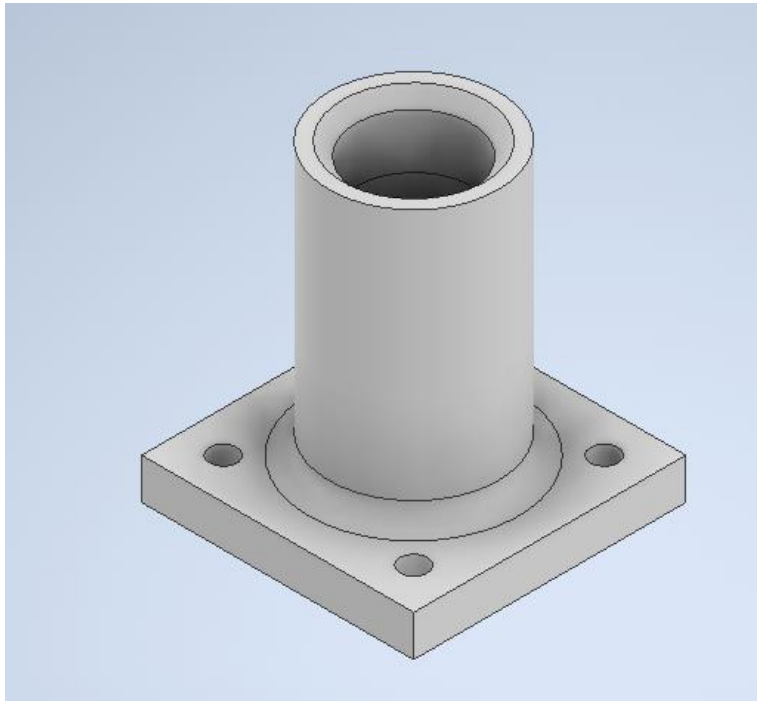
- Evaluation of adequacy of duck + support ☒
  - Blocker
    - No support validated and no duck model chosen
- Sketch a 3D design that can be used fixed configuration of object and tools (eventually the supports) (needed to be verified by expert) ☒
  - Blocker :
    - Not validated yet

Impression 3D

Part of milestones

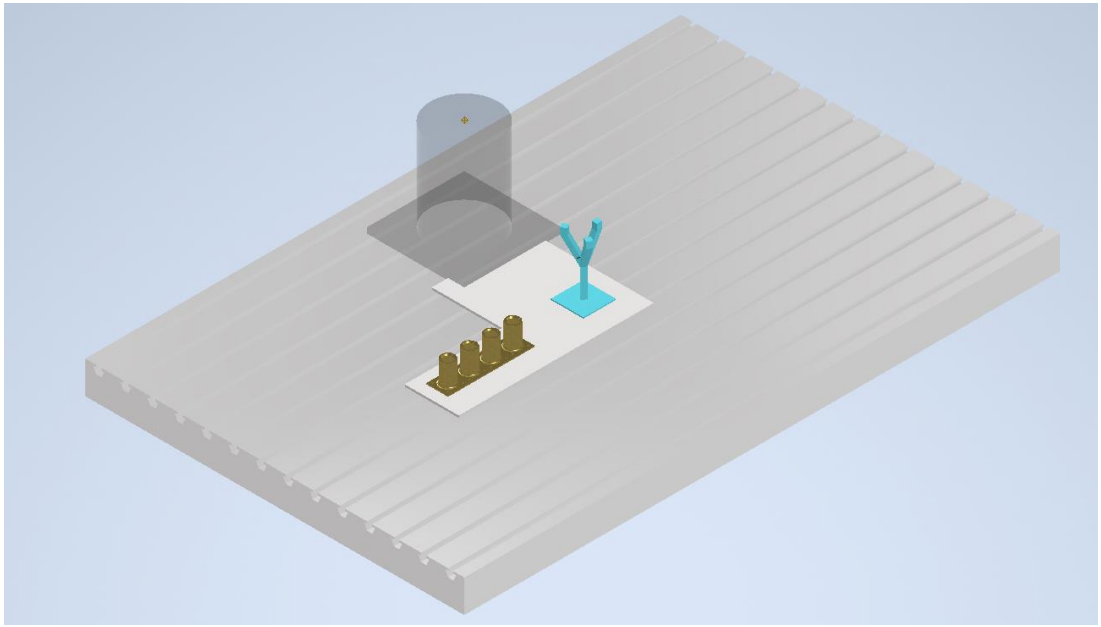


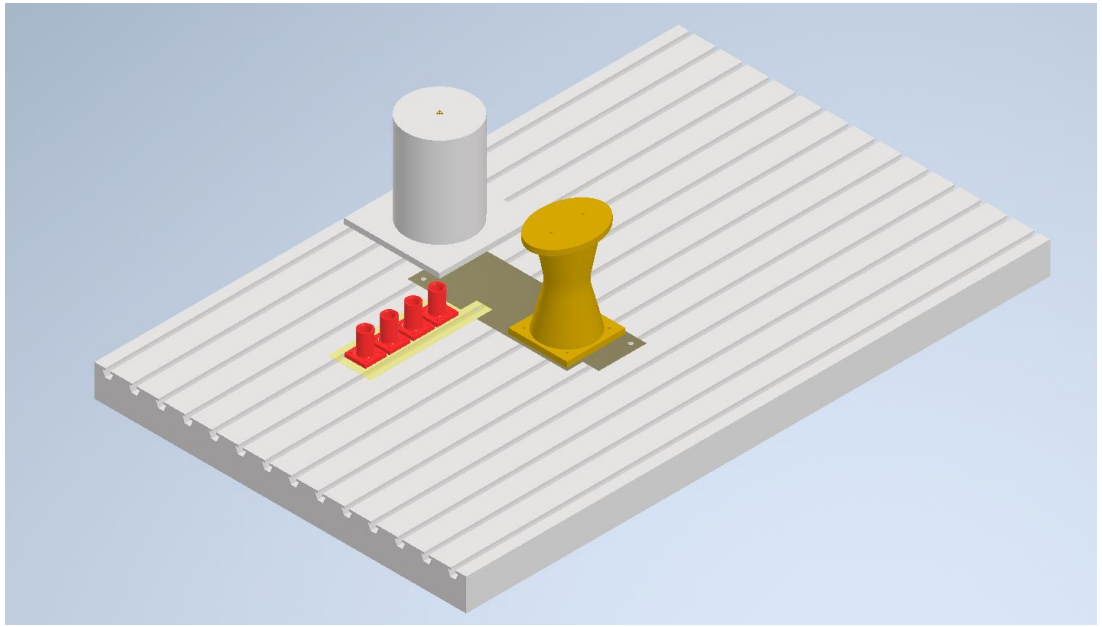
New assembly with pins system



Valid & printed pen support

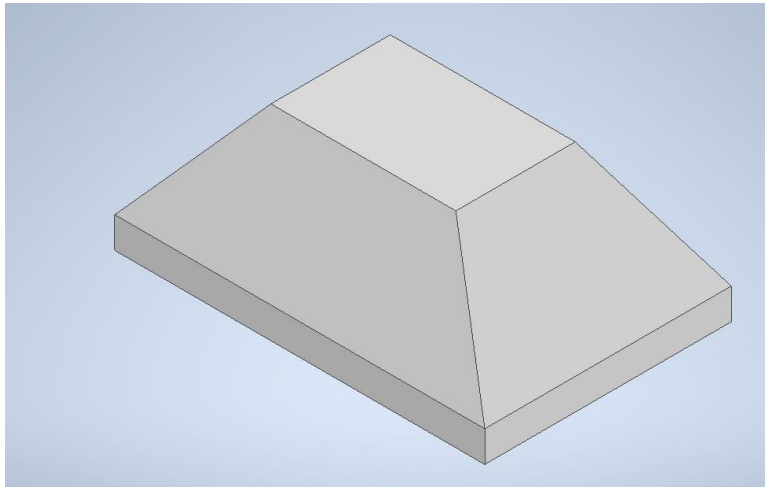
Impression 3D





Impression 3D

Respond to demand of the team :



Truncated rectangle pyramid for drawing on slops (50° and 60°)

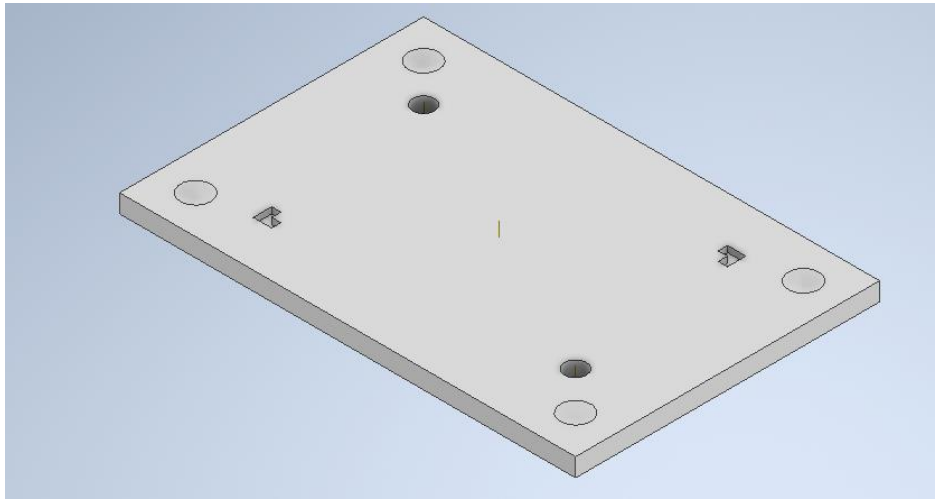


Plate for a full pipeline validation

Impression 3D

Milestones planned for week 3 :

- Validate, product and get the necessary wooden pieces
- Validate assembly
  - Get a reliable measurement for critical point
    - Distance between support and robot
    - Optimal height of the duck support
    - Optimal size of the duck (more or less given by CEO)
- Validate and print non-printed piece
  - Duck
  - Duck support

Week 2 : conclusion

- Main week milestone wasn't reached
  - Why ? (issues):
    - Communication
    - Planification
    - Autonomy

week 3 : milestones