Week	Milestones
W1	• Robot ▸ Assess python libraries and virtual simulator ▸ Basic arm calibration with the usage of the integrated camera (α) ▸ Move robot programmatically: follow instructions, move arm A $\rightarrow$ B ▸ Grab and release a predefined object at a predefined location. ▸ Define robot range, constraints and precision • LLM/AI ▸ Select and test generative AI solution to create textures from a textual prompt ▸ Create a few textures (4-5) stored and labeled • Tracing ▸ Select unwrapping solution (projection, direct AI generation, …) ▸ Lay out algorithmic steps for generating drawing instructions from a texture • 3D Modeling ▸ Sketch supports, verified by expert ▸ Print duck to experiment with 3D printer • Admin ▸ Precisely define MVP (what it is / isn't) and milestones ▸ Define interfaces between steps ▸ Complete the milestones for the whole 7 weeks (this table)
W2	• Tracing ▸ Pipeline done : wrapped texture to 3D drawing segments ▸ Define performance evaluation criteria • 3D Modeling ▸ Duck supports are printed ▸ Print base duck model **Blockers**: – not useful at the moment ? – unclear constraints ▸ Evaluate adequacy of duck+support ▸ Sketch a 3D design that can be used to have a fixed configuration of object and tools (eventually the supports) (needed to be verified by expert) • Robot ▸ Hand-eye TCP calibration **Blockers**: – access to robot ▸ Assess pen gripping constraints ▸ Draw on a 2D surface following instructions (tools already set and grabbed by the robot) – If successful, draw more complex shapes/filling (e.g. infinity shape + multiple pass) – If successful, draw on a 3D plane ▸ Add mock shapes into the virtual simulation

Week	Milestones
	▸ Can grab and change tools and manipulate them (not drawing only hold into a initial position) • LLM/AI ▸ Select and test generative AI solution to create textures from a textual prompt **Blockers**: – access to disco/cha-cha – client's decision (internal / external solution) ▸ Evaluate generative model limits: prompt fidelity, instructions following (output format/shape) ▸ Create a few textures (4-5) **stored and labeled** ▸ Create quality benchmark for evaluating/comparing GenAI solutions • General ▸ Choose and get pen ▸ Choose duck model ▸ Get client feedback/commitment to a solution ▸ Create basic fully integrated pipeline **End goals** • Paint a simple pattern (line) on cubic duck (through the whole pipeline) • Bottlenecks: ▸ 3D printed duck ▸ Pen
W3	**Project overview / scrum-master**: Nathan • Tracing ▸ Define performance evaluation criteria ▸ Cross-face traces ▸ Multicolor texture pipeline ▸ Detection of multiple nested contours • 3D Modeling ▸ Validate all the non-validates pieces : – Duck support – Duck – Wooden base ▸ Have the wooden piece used as support to arrange the position of the rest (pen support, duck support) done ▸ Have a support of duck printed • Robot ▸ **Safely move robot arm** ▸ Can grab and change tools and *manipulate* them (not drawing only hold into a initial position) ▸ Draw with at least 2 different pens using tools manipulation (**see above**) ▸ *Refine robot drawing pipeline: schema and notebook example* ▸ Draw on a 3D surface no plane (Duck!) with multiple pens (switching tools)

Week	Milestones

	• LLM/AI
	  ▸ Create full automated benchmark to evaluate and compare models, prompts, methods
	  ▸ Solution that can generate a (future used model) duck with results that respect the constraint of the prompt without hallucinating using prompt engineering
	  ▸ Explore resource-heavy solutions on Chacha and Disco, gather the results, and conduct a comparison
	• General
	  ▸ **MVP / Prototype**
	End Goals:
	• Draw on a 3D duck

W4	• Robot
	  ▸ Optimize calibration / drawing precision
	  ▸ Constant drawing pression
	  ▸ Control drawing angle
	• UI
	  ▸ Functional interface to trigger pipeline (according to CEO's needs)

W5	• Robot
	  ▸ Optimize calibration precision
	  ▸ Constant drawing pression
	  ▸ Control drawing angle

W6	• Robot
	  ▸ Optimize drawing speed
	• General
	  ▸ Functional product (β)

W7	• Robot ▸ Reserve