Silicon Perception

Seed Round

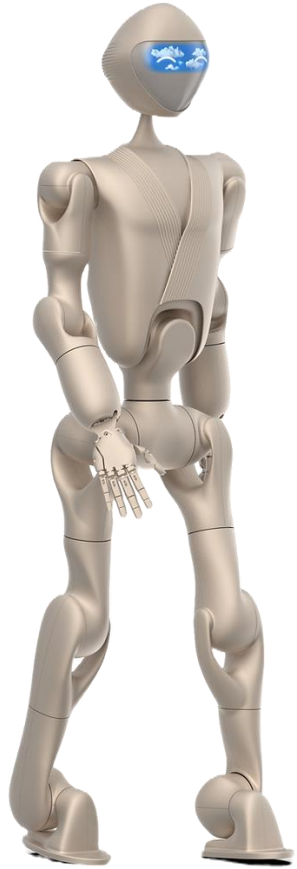
Oct 2024

Company Mission

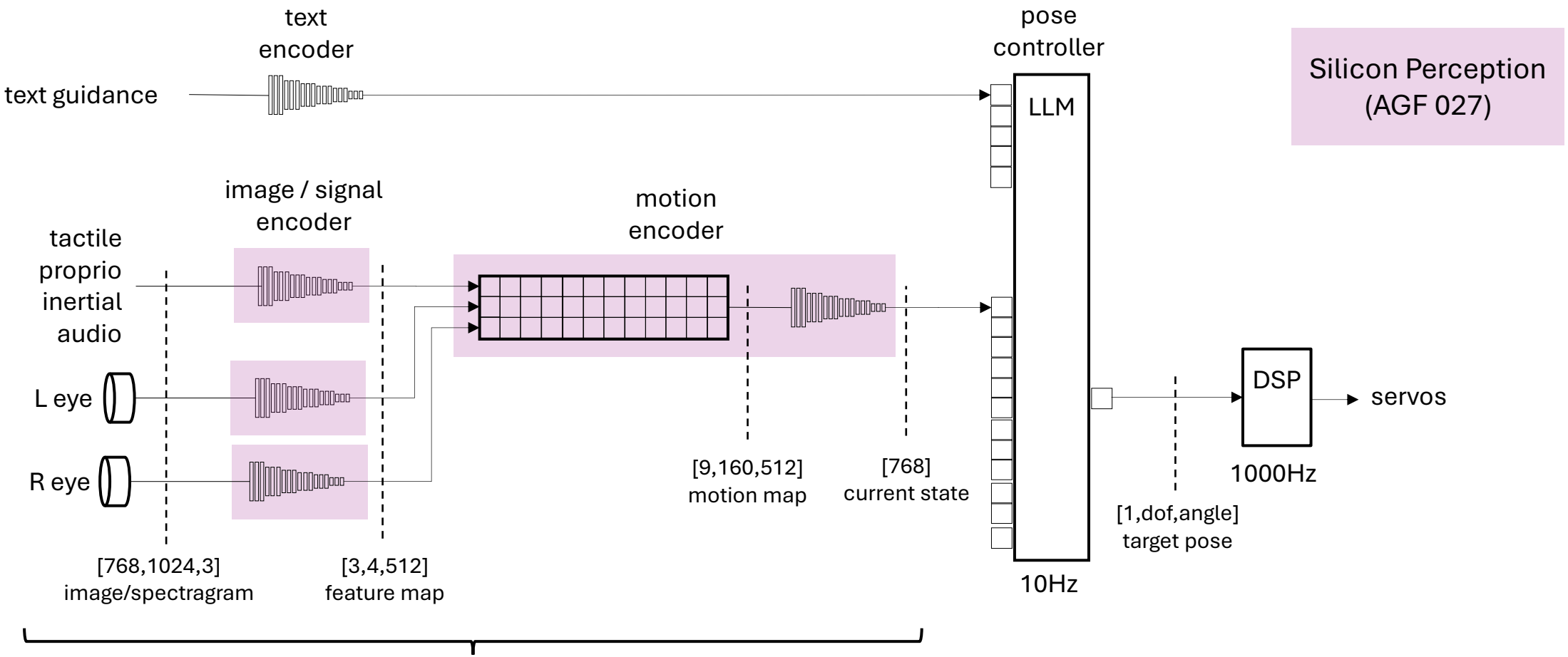
Deliver industry leading silicon for autonomous humanoid robots

In 2-5 years :

- Robots will be controlled by differentiable models
- Low latency perception will enable agile hand-eye coordination
- Single chip foundation models will become a new silicon category



Reference Architecture



<10ms constant latency, 1024x768 pixels, 200 frames/s

Target Market

- Boston Dynamics
- ABB Ltd
- Tesla
- Apptronik
- iRobot
- Halodi Robotics
- Anvil Labs
- Agibot
- Agility Robotics
- Engineered Arts
- Vecna Robotics
- Hanson Robotics
- Beyond Imagination
- Macco Tecnologia Para el...
- American Robotics
- Bristol Robotics Laborato...
- Figure AI
- PAL Robotics
- Anduril Industries
- UBTECH Robotics
- FANUC
- Piaggio Fast Forward Inc.
- Kinova robotics
- DENSO Robotics

Applications

- Data collection
- Teleoperation
- Autonomous robots

Total Available Market

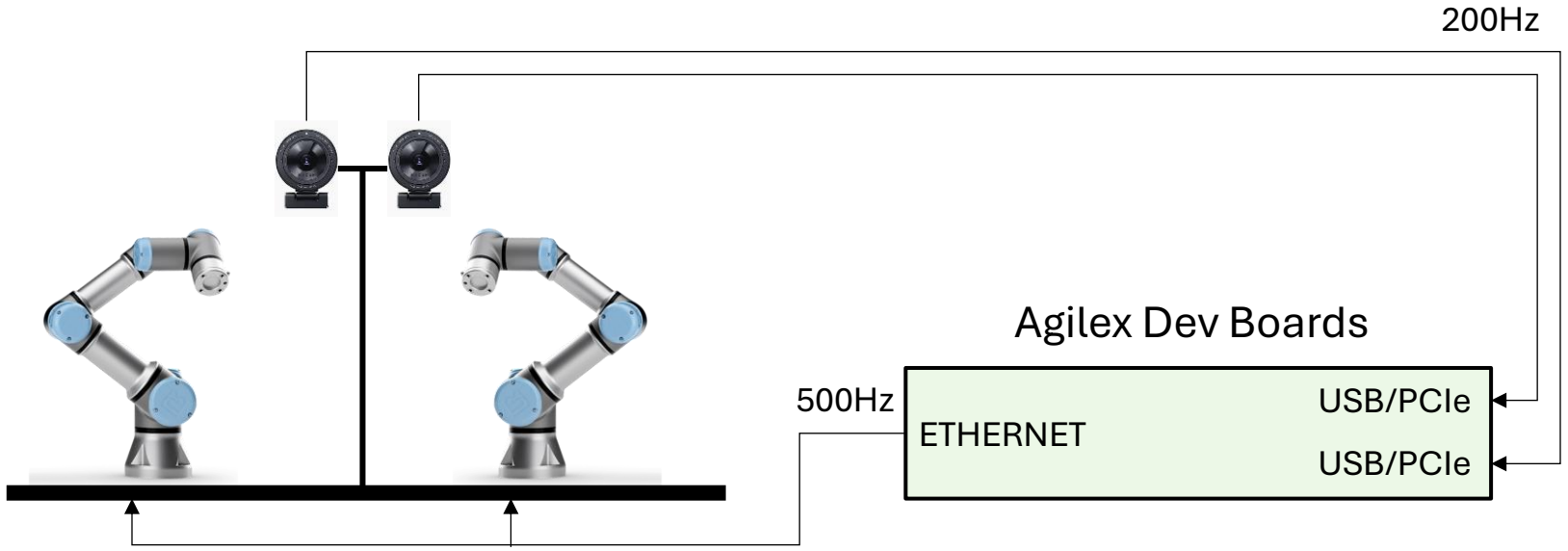
- 10M robots/year
- 4 SP devices/robot

Related References

Paper/Website	Year	Significance
Stanford HumanPlus	2024	Human imitation learning PoC
DeepMind Table Tennis	2023	Defines high speed, low latency requirements
DynaMo	2024	Self-supervised pretraining for robot models
Facebook Sapiens	2024	Frontier image encoder for knowledge distillation
www.siliconperception.com	2024	Custom silicon for humanoid robots

Reference Design Proposal

Hardware

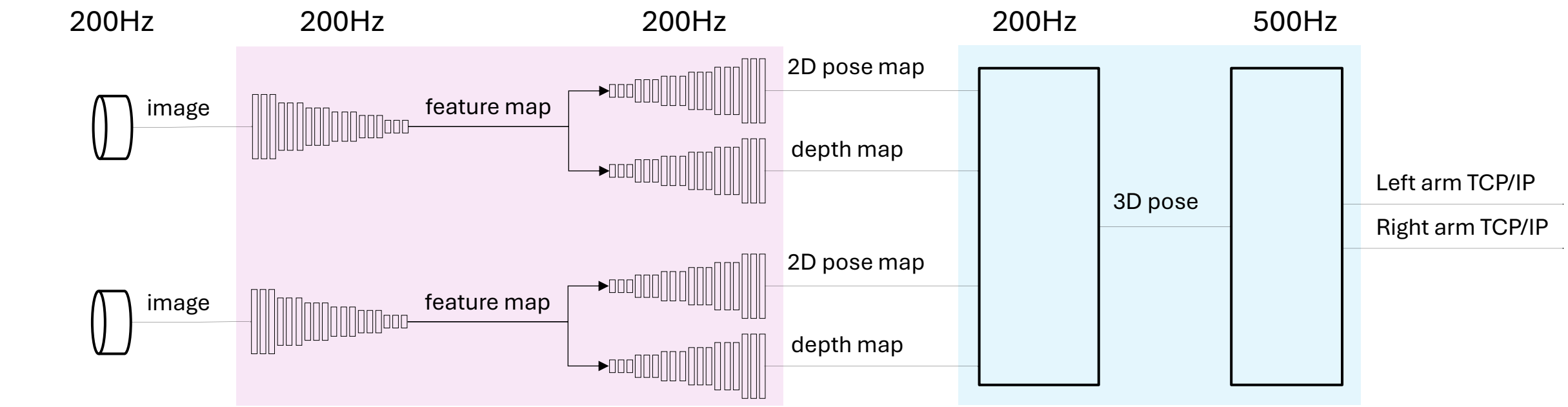


- Phase 1: two UR30 6-DoF arms with binocular Ximea MQ013CG-ON cameras
- Agilex end-to-end, <10ms pixel-to-servo
- Vary latency for demonstration, e.g. <10ms, *50*, *100*, *200* ms
- **Roadmap: hands/grippers, VR+active vision, full humanoid, autonomous**

Architecture

Agilex SoC

Agilex Fabric



Execution Plan

Demo lab workspace		TBD
Equipment budget, $300K capex assets		TBD
Image encoder pretraining	0w	Silicon Perception
Demo dataset image capture, synchronous binocular at 200 frames/s	3w	Silicon Perception
Demo dataset pseudo-label generation using Sapiens 0.3B model	3w	Silicon Perception
End-to-end training using images and pseudo-labels	3w	Silicon Perception
Image encoder top level RTL/DV, Quartus bitstream generation	8w	Silicon Perception
Pose/depth decoder top level RTL/DV, Quartus bitstream generation	4w	Silicon Perception
Triangulation/tracking algorithm and software, 200 frames/s, Agilex SoC	4w	Silicon Perception
UR-30E system software and safety using RoS, Agilex SoC	4w	Silicon Perception
Testing and refinement	12w	Silicon Perception

Budget

Equipment Item	Quantity	Cost
UR30 6-DoF arm	2@$60K	$120K
MQ013CG-ON camera	6@$3K	$20K
Agilex AGF-027 dev board	6@$10K	$60K
Xeon server + A100 GPU	4@$25K	$100K