



ARTIFICIAL INTELLIGENCE & ROBOTICS, DOMAINS IN MOTION

GIOIN – AI & ROBOTICS SESSION

MAY 15TH, 2020

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ARTIFICIAL INTELLIGENCE AND ROBOTICS ARE TECHNOLOGY DOMAINS WITH PARTICULARITIES

ARTIFICIAL INTELLIGENCE

- Understanding signals
- Discovering patterns
- Predicting best option
- Data driven
- Inferential computing
- Cloud-based
- Reviewed by Humans

ROBOTICS

- Automating actions
- Performing restlessly
- Repeating accurately
- Position and force driven
- Deterministic computing
- Edge-based
- Instructed by Humans

ARTIFICIAL INTELLIGENCE AND ROBOTICS ARE LITTLE CONVERGING, SO FAR...

ARTIFICIAL INTELLIGENCE

ROBOTICS

Martian Rover



Collaborative Robot



Companion Robot



Drone



Cleaning Robot

... WE'LL SEE MORE AND MORE INTERSECTION MAKING "AUTONOMOUS SYSTEMS" AVAILABLE

ARTIFICIAL INTELLIGENCE

ROBOTICS



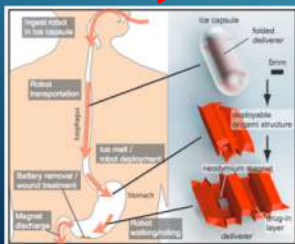
Self-Regulating Automation



Collaborative Robot 2.0



Hazardous Environment Robot



Ingestible Robot



Autonomous Vehicles



People Care Robot

ALL STARTUPS CLAIM TO BE A.I.-ENABLED BUT ONLY SOME COULD BE REALLY SCALABLE

Facts about A.I.

- Data quantity makes the difference
- Huge effort to make data ready
- Stable data flow won't last long
- Too many techniques, no one perfect
- More and more tools to perform utility tasks (eg. NLP, image detection)
- Outcomes require expert's judgement

Implications for A.I. realism

- Few companies have enough data to get good accuracy (with minor cleaning)
- Be ready to keep spending 2/3 in data preparation (esp. if data change)
- Use cases expertise is the absolute must
- Leveraging available resources is the success factor (beyond use case focus)
- Try & error... A.I. project never ends

INVESTORS SCRUTINIZE MORE DEEPLY A.I. STARTUPS

BEST A.I. STARTUPS EITHER FOCUS ON VERTICALS OR LEVERAGE PLATFORMS AND ECOSYSTEMS

Industry Solutions

Platform Feature Sets & Enablers



Source: CB Insights

LOOKING AT DESTINY OF 2019's A.I.-100 WE MAY GUESS THE OUTCOMES FOR 2020



- \$4.9B fundraising (for 48 Inc.)
- 4 new Unicorns
- 9 acquisitions
- Many partnerships with large tech corporations
- Apple, Google, Microsoft, Facebook, Intel, Amazon the most active acquirers ever
- Deals almost occurred in US

A.I.-100 ARE OFTEN FOUNDED BY TECH GIANTS ALUMNI

Source: CB Insights

AUTONOMOUS VEHICLES ATTRACT THE LARGEST PART OF A.I.+ROBOTICS FUNDING



Source: PitchBook

- \$40.0+B total fundraising
- \$5.0B fundraising in 2019 (est.)
- \$4.3B fundraising in 2020
 - \$2.3B Waymo (March)
 - \$1.0B Nio (April)
 - \$0.5B Pony.ai (February)
- Players from various industries
 - Car & Trucks Makers
 - Automotive Component Makers
 - SW/Digital Economy Giants
 - HW & Networking Companies
 - Logistics Operators
 - ...

CORE SPACE OF AUTONOMOUS VEHICLES SHOWS WELL-FUNDED BUT LITTLE KNOWN STARTUPS

70+ Startups Revolutionizing Auto With AI

Connected car tech

Fleet management

AVRIOS fleetx Fleetonomy

Cybersecurity

Upstream SAFERIDE Trillium

Driver monitoring

edgetensor :) Affectiva GUARDIAN

Insurance

TRACTABLE TrueMotion Driveway
metromile

In-vehicle voice tech

:snips wLuper MYCROFT AI CLOUDCAR

eyeSight LIGHT METRICS carvi
cardioid lytx stroma

Autonomous vehicle tech

HD mapping

DEEPMAP NODAR Mapillary
WAYZ ARTISENSE Civil Maps

Edge processing

FABU 地平线 TERA1

Fully autonomous vehicles

NURO ZOXT STANIS ROBOTICS
EASY MILE

Simulation

RIGHT-HOOK parallel domain CVEDIA
Playment cognata metamoto

Perception

AMBEVE BARAJA AUTO3ON METAWAVE HUMANISING AUTONOMY
deepen STRADVISION DEEPSCALE compoundeye
ADASKY AEYE PERCEPTIVE AUTOMATA 商汤 TETRAVUE

Self-driving software stack

Propelmeo AMOTIVE pony 2048 may mobility INNOVANTA
plus.ai AutoX Kodiak PROTERRA WeRide
Simple IMAGRY AURORA voyage
PTIMUS RICE 知行科技 EMBARK drive.ai



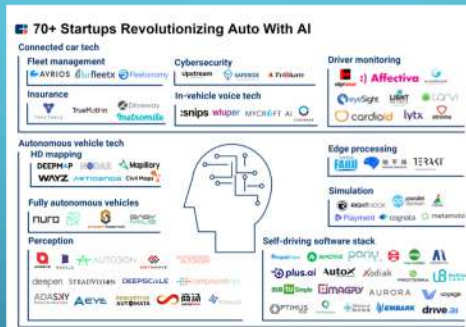
CORE SPACE OF AUTONOMOUS VEHICLES SHOWS WELL-FUNDED BUT LITTLE KNOWN STARTUPS



ZOOX – Autonomous UBER



EasyMile – Urban Commuting



NURO – Urban Delivery



STARSKY – Long-haul Freight

Source: CB Insights

NOT JUST AUTONOMOUS VEHICLES, THE WHOLE LONG/SHORT-HAUL LOGISTICS GET TRACTION

60+ startups tackling trucking tech

Freight matching



Freight tracking & visibility



Automated driving



Driver tools



Fleet management



Last-mile delivery market map

Autonomous ground delivery



On-demand delivery



Urban fulfillment



Drone delivery



Cloud kitchens



E-commerce logistics



Delivery management



On-the-way shipping



Route optimization



INDUSTRIAL ROBOTICS STARTUPS ARE NOT SO MANY DUE TO ENTRY BARRIERS AND EXIT OUTLOOK...

V E R T I C A L	Warehouse Stationary Piece Picking Righthand Robotics, COVARIANT.AI, OSARO, vicarious Kinema Systems, EMMETI, PlusOne Robotics Palletizing Kinema Systems, EMMETI, PlusOne Robotics Transportation fetch Robotics, CLEARPATH Robotics, LOCUS, 6 RIVER SYSTEMS Mobile Manipulation IAM Robotics, MAGAZINO Storage Systems COGNOSENSE Robotics, Geek+, IAWA Robotics	Manufacturing CARBON Robotics, SYMB.IO, SMART Robotics, CapSen Robotics, REVOBOTIK	Agriculture BLUE RIVER TECHNOLOGY, NOiE, abundant Robotics Service/Construction saviok, Agility Robotics, bossanova, Marble Healthcare/Surgical VERB SURGICAL, AETHON, TITAN MEDICAL
	Sensing AQUIFI, PILOT.AI, PERCEPTIN, Pickit, COGNEX, BASLER, HUMATICS	Processing (planning/control/modules/ROS) ROS, realtime robotics, veobot, ENERGIID Robotics and Machine Vision, AUTRONIC ROBOTICS, MODBOT, RAVEN[OPS]	Actuation/Gripper SOFT ROBOTICS, NITTA, SCHUNK, purple+ robotics, EMPIRE Robotics, ROBOTIQ
H O R I Z O N T A L		Food ZUME PIZZA, MOMENTUM MACHINES, MISO Robotics	

Source: Robotics Biz

...HOWEVER ROBOTICS LANDSCAPE SHOWS ESTABLISHED PLAYERS COVERING ALL VERTICALS



Source: Mooreland Partners

FINAL THOUGHTS ON OUTLOOK POST-COVID19

- Artificial Intelligence and “autonomous” Robotics are top technology foundations over the next decade (beyond Life Science)
- Investments may slow down, a bit and shortly due to likely turmoil, but they would keep on bold and Investors would become more selective
- US and China will lead the race, Europe can play extremely well leveraging industrial machinery and competences
- Covid-19 has broken some paradigms and A.I.+Robotics can benefit from, especially regarding people and goods transportation, people care, decentralization of productions