



The world's first mind-controlled bionic arm

"The most advanced robotic arm in the world." — Quartz

"Amazingly human. A breakthrough." — 60 Minutes

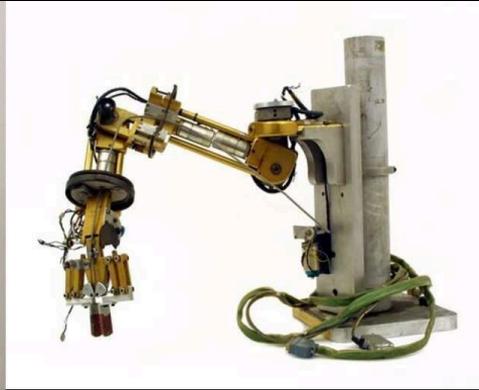
"Like something from space." — CNN



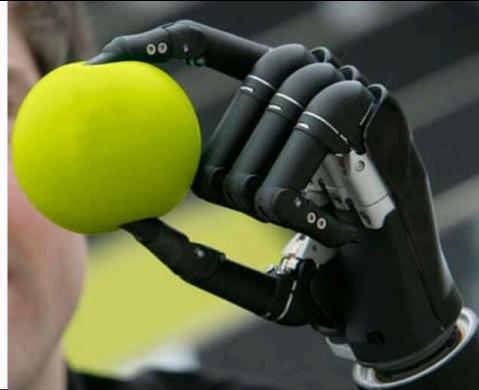
Imagine fully-human robotic limbs...
That's where we're headed.



1495
Da Vinci's Robotic Man



1963
Rancho Arm



2007
i-Limb Hand



???

2020
What's next?

... so what's stopping it?



Poor neural control

No finger control

No tactile feedback

Introducing the Atom Touch

A revolutionary human-scale robotics & neural control breakthrough

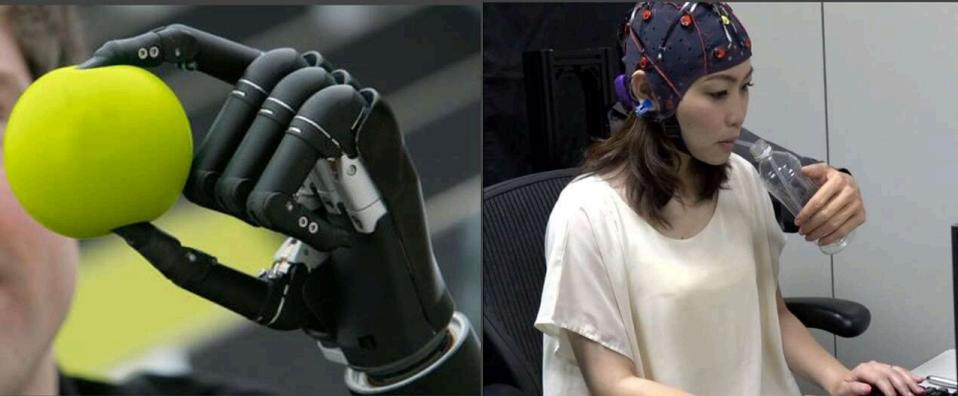




Watch our arm
in action

Click anywhere
to play (30s)

“State of the art” robotics



20lbf pinch grip

2 sensors

5 actuators, 10 “grips”

Point-and-click control

Delayed reaction

Visual feedback

Atom Touch



70lbf grasp, 45lb curl

200 sensors

17 actuators, 26 DOF

Neural “mind” control

Realtime input

Tactile feedback

As strong & fast as a human arm

Internal state & 3D position

Full arm, hand, & finger dexterity

Intuitive UX

Semi-proprioception

Sense of touch

Invented at JHU APL. Funded by DARPA. Optioned by Atom.

\$120M DARPA grant, 2005



Program:

Revolutionizing Prosthetics 2009

Status:

Complete

Outcome:

World's most advanced
lifelike bionic arm

We have an exclusive option agreement.
License negotiation after round raise.

OPTION AGREEMENT

This Option Agreement (hereinafter "Agreement") is between The Johns Hopkins University Applied Physics Laboratory LLC, a Maryland limited liability company, with its principal office at 11100 Johns Hopkins Road, Laurel, MD 20723-6099 (hereinafter "JHU/APL") and Atom Limbs, LLC (hereinafter "Company"), having an address at Address needed.

This Agreement includes an attached Appendix A (Schedule of JHU/APL Intellectual Property) and Appendix B (Fees and Payment Options).

RECITALS

JHU/APL, by virtue of its role as a nonprofit, University Affiliated Research Center (UARC), carries out scientific and applied research and development through its staff and is committed to bringing the results of that research and development into widespread use.

The Johns Hopkins University (hereinafter "JHU") through JHU/APL has acquired or is entitled



Trialed by 20 amputees/quadruplegics



Les Baugh, bilateral amputee

Tested by defense & govt



"Robo Sally", IED Disarmament



PBS NewsHour's Miles O'Brien, teleoperations



Air Force Tech. Sgt. Joe Deslauriers

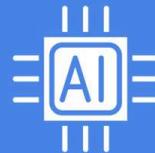
Neural “mind” control



MoleculeOS

In the cloud 

Prediction & assistance
Progressive autonomy
User archotyping



Neural Fusion

On each Atom Touch 

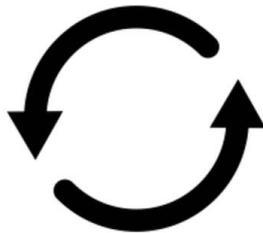
AI-powered neural fusion unit
Realtime internal state model
100s of neural sensors

Accruing advantage: more usage → improved performance



Improved performance

Live OTA updates.
Increased accuracy.
Predictable assistance.

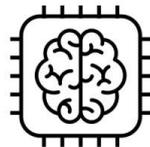


More users



Deep learning at scale

Computer vision.
Prediction.
Real-world usage.
Only prosthetic with AI.



\$2B market opportunity in the U.S.



50K

Arm amputees



150K

Hand amputees



1.8M

Leg amputees

Revenue

\$100-200K/arm
50% per-unit margin

Sold to amputees & prosthetists
Reimbursed by insurance

vs. competitor arm cost: \$50-250K

Market:



VA



U.S. Department
of Veterans Affairs



Team



Tyler Hayes
CEO

Previously cofounder of Bebo (acq. Amazon). Neuroscience at St. Olaf.



Joe Moak
CTO

20 years leading engineering at NeuroPace, St. Jude Medical, Seismic, Apple



Doug Satzger
CDO

30+ years leading Industrial Design at Apple, IDEO, Intel, and Palm.



Mark Salada
CRO

20+ years robotics & haptics at Intuitive Surgical, NASA projects at Johns Hopkins APL, and Apple.

Original inventors



Eric Faulring
Lead roboticist on prototype. Chief Engineer at HDT.



Bobby Armiger
Principal engineer on prototype. Applied physicist at DARPA and Johns Hopkins APL.

Advisors

Medical & Regulatory



Albert Chi, M.D., OHSU
Leading TMR surgeon in U.S.
100+ TMR surgeries, incl. Johnny's



Shawn Becker, CEO, Silvercat Advisors
Medicare + Reimbursement



Jared Seehafer, CEO, Enzyme
FDA + Clinical Trials

Defense



Navy Cmdr Jonathan Forsberg, M.D. Ph.D.
Director, Osseointegration Program,
Department of Defense

Go-To-Market



JHU option agreement

JHU license

FDA pre-sub & trials

FDA approval

First sales



Prototype diligence

Transfer & architecture

EVT

DVT

Production



Risks & challenges

Drive down cost

Alpha parts+labor cost: \$300K/arm

We've already identified the key cost reduction areas and have a roadmap to get from \$300K → \$30K in 1-2 years.

Software & controls progress

UX: functional, usability vs. mastery

Today: usable in 5 mins. Perfectly mimics movement and retains proprioception for “intact” users. For amputees, usable in 5 minutes, master in 1 month.

Hardware progress

Arm is robust, known hand robust today

Already identified major high-impact improvement methods, e.g., IP67 protection, EMI shielding, etc.

Reimbursement

Payers: require “need demonstration”

- Complicated process. Spin up group internally to assist patients & providers
- Common pattern in DME. Teams specialize in making this transition
- Payers want product to realize value

The Future Human Body 2.0





Upcoming campaign, October 2020
\$250K-\$1M raise

Next milestones

Close license
Complete tech transfer
Production-intent architecture
FDA pre-submission

Current investors

VILLAGE

\$150K, June 2019

Materials available

Financials: cost reduction pathway,
productization mfg plan, BOM

Science: clinical trials, research papers

Regulatory pathway

Reimbursement breakdown