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TAVIPILOT – A unique AI&Robotic solution for optimizing TAVI Procedures

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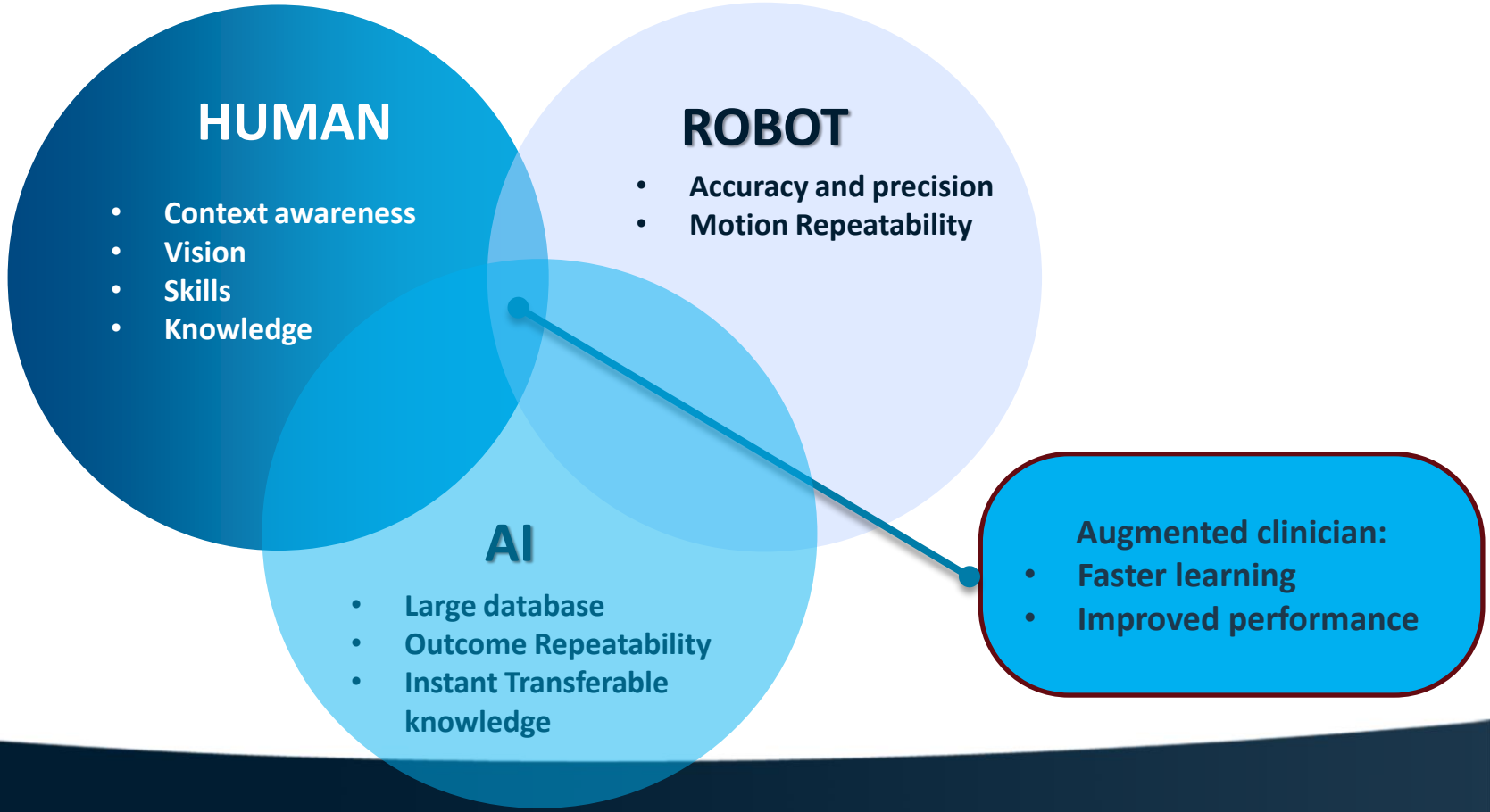
Disclosure of Relevant Financial Relationships

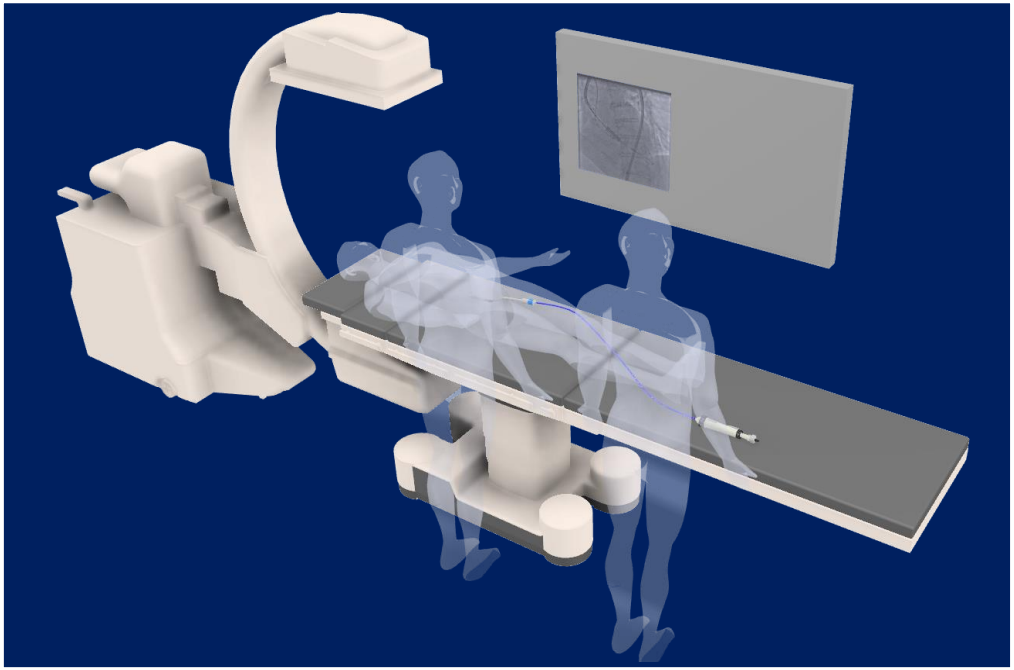
I, Mircea Moscu, am presenting as Project Lead with Caranx Medical.

Faculty disclosure information can be found on the app.

Why Robotics and AI?



Access to TAVI and outcomes can still be improved



1000' — *Thousands of patients eligible to TAVI remain untreated worldwide due to lack of operators*

~10% — *Due to THV depth, ~10% of patients have conduction disorders and need pacemaker post TAVI*[1]

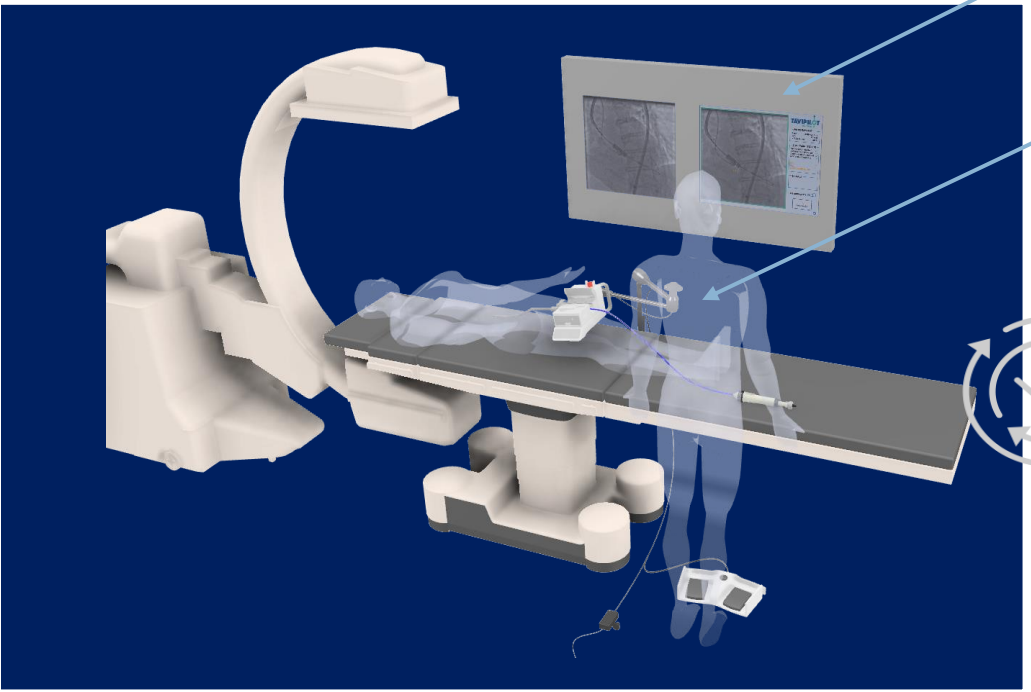
~3% — *Due to THV depth, ~3% of patients have stroke post TAVI*[1]

~2x — *TAVI centers performing less than 100/year have a ~2X higher mortality rate than other TAVI centers*[1]

75% — *75% of cardiologists identify valve positioning as the most critical steps, followed by valve delivery*[2]

(1) TVT registry US 2021 - Ann Thorac Surg 2021
(2) Interview conducted in 2022 with 60 cardiologists from US and 3 countries in EU / Quomeda external market research

TAVIPILOT Solution



TAVIPILOT Software – FDA cleared:
Real-time intra-operative guidance of TAVI with millimetric precision

TAVIPILOT Robot – in development, expecting FDA clearance 2026
TAVI Catheter Driver:
- **Potentially reducing to *1 single operator***
- **Driven by TAVIPILOT Software**

TAVIPILOT solution aims to:
- **Increase accuracy for valve positioning (mm precision)**
- **Reach less variability between users**
- **Potentially reduce side-complications such as pacemaker implant, etc.**

TAVIPILOT Software is able to track anatomy and instruments in real-time on fluoroscopy images

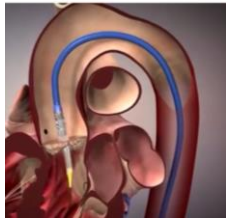
- The AI detects and tracks the anatomy and instruments, following breathing and heart motion
- AI trained on the world's largest TAVI database (> 5000 patients)
- Once the contrast injected, the AI overlays NCC and initiates anatomical tracking
- Once the contrast dissipates, augmented reality continues tracking
- The implantation depth is measured for accurate positioning

TAVIPILOT Software: agnostic to C-arm imaging device

	Siemens Artis	GE Discovery IGS7	Philips Azurion
Device			
Compatibility	✓	✓	✓

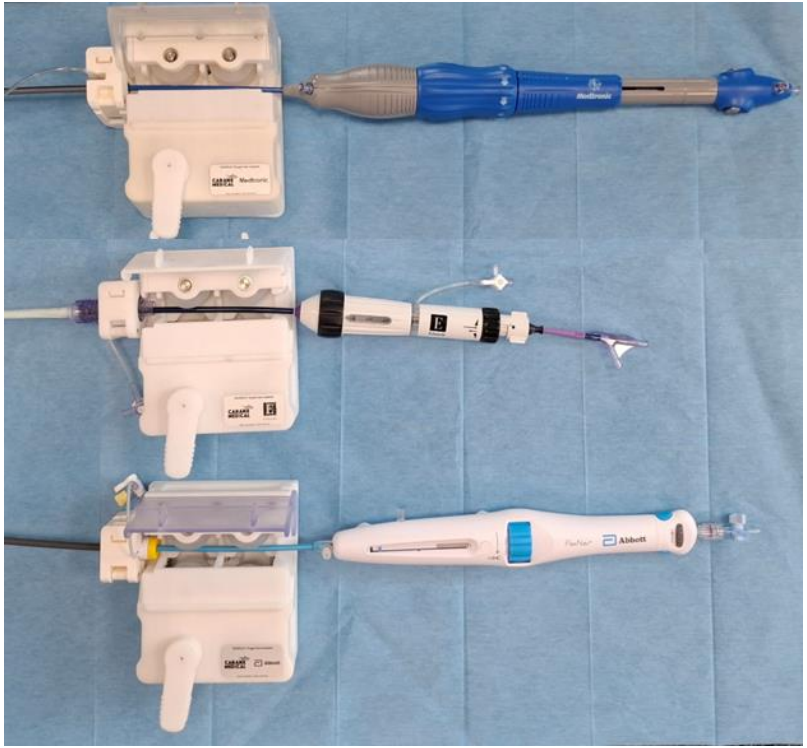
TAVIPILOT Robot (in development) – Principle of operation

Stent positioning phase



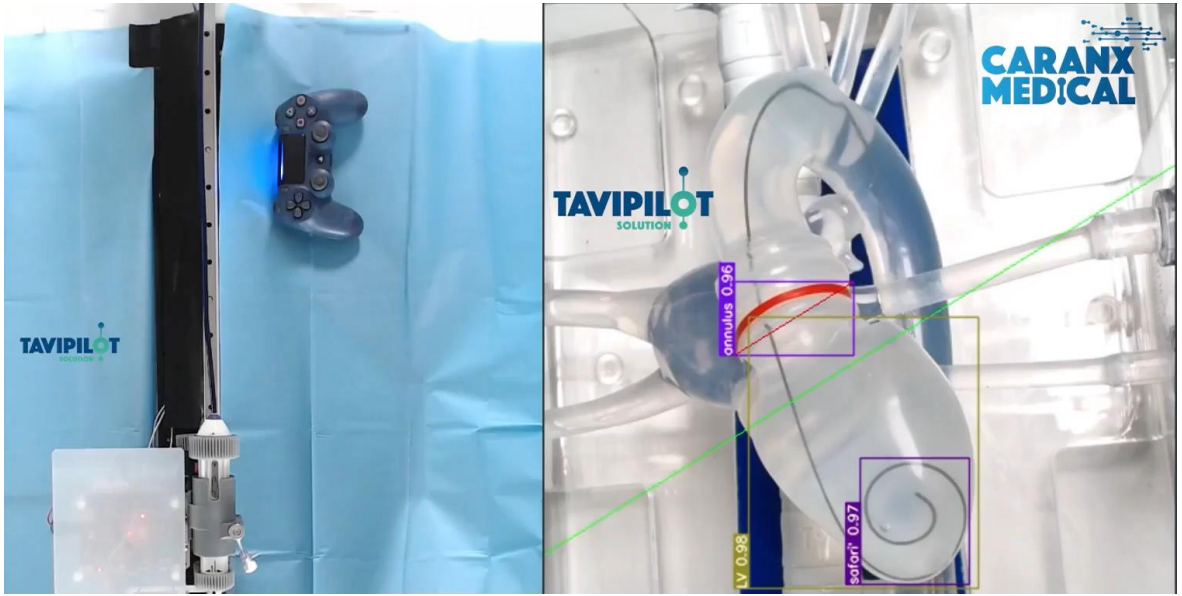
- **Foot pedal** in development could allow **single operator use**

TAVIPILOT Robot (in development)



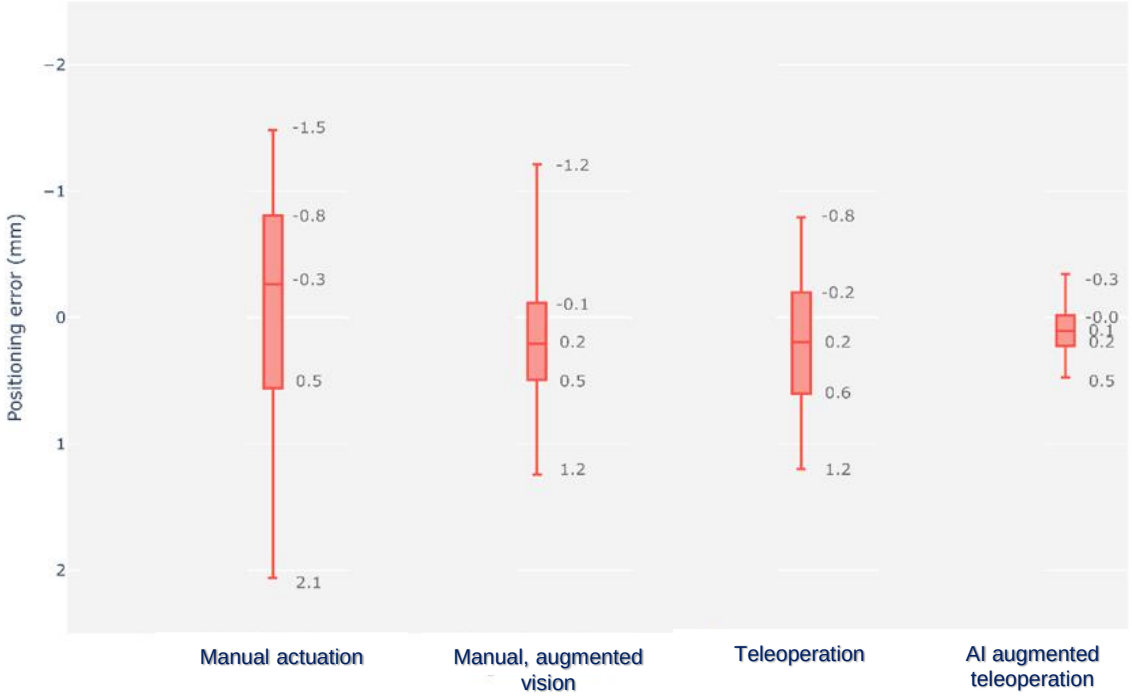
- **Dedicated cassette** for each delivery device
- **Balloon or self-expandable valve** are managed manually by the operator
- **Compatible** with existing TAVI devices

Combined TAVIPILOT Software + Robot: Augmented teleoperation (in development)



- **AI** controls the robot
- **Clinician controls the AI**
- **Clinician can revert** at any time

AI Augmented Teleoperation: a faster learning curve and improved performance, tested on phantom



frontiers

Towards autonomous robot-assisted transcatheter heart valve implantation: in vivo teleoperation and phantom validation of AI-guided positioning

Jonas Smits[1†*], Pierre Schegg[1†], Loic Wauters[1], Luc Perard[1], Corentin Languepin[1], Davide Recchia[1], Vera Damerjian Pieters[1], Stéphane Lopez[2], Didier Tchetche[3], Kendra Grubb[4], Jorgen Hansen[1], Eric Sejor[1,5] and Pierre Berthet-Rayne[1,6]

TYPE Original Research
PUBLISHED 21 October 2025
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- Tests performed by 3 TAVI experts
- 60 procedures on each test

Conclusion

- TAVIPILOT Software: **FDA cleared, the first real-time AI solution for intraoperative TAVI guidance** with millimetric precision

- TAVIPILOT Robot: In development, the first robotic solution for TAVI to facilitate valve positioning

- TAVIPILOT Augmented Teleoperation: Enhancing valve placement precision and democratizing TAVI

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