THE CHALLENGE

Surgical Outcome Success vs. Failure

Surgical Intelligence = Skill + EXPERIENCE

Experience is not Easily Quantified or Shared

How do we access, quantify, and distribute surgical experience?
What if we could develop an AI system that would learn those patterns?
Then tailor and present this information back to all surgeons in real-time?
ARTIFICIAL OPERATIVE ASSISTANT

Development Roadmap

AOA Function

Intraoperative Predictive Analytics

Intelligent Guidance

Surgical 'Advisor'

Building Block

Advanced image processing algorithms

Correlative outcome metrics

Hidden object detection & trackerless navigation

Tissue-instrument interactions & scene indexing

Anatomical & surgical object segmentation & tracking

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Patent pending
Currently - Q3 2020
Image annotation, network training

2021
UI Design, Expand AOA hierarchy for other surgeries

2023
Initial market launch (100 hospitals)

Q4 2020
Validation with Pilot Study

2022
Begin testing as training aid (10 centers), FDA approval process (breakthrough device designation)

Development Timeline:

Focus:
Stage I - Current development activity
Stage II/III - Expansion, Clinical validation
Stage IV - FDA approval, Market launch

SBIR/STTR Funding:
Phase I Funding
Phase II Funding
Phase III Funding
PATH TO MARKET

Market Size

Surgeries Per Year ( Millions)

Global 184.2 M
US 50 M

Surgical care - 5% of US GDP

Customer Segments:
Hospitals/Health Systems

Surgeons

Surgical industry partners

Cost Structure:
Product development

Product delivery

Service/Maintenance

Employees

Revenue Streams:
1. Access to segmented and labeled videos for teaching institutions/training
2. One time acquisition cost per hospital/surgeon/operating room of integrating equipment
3. Subscription service for cloud access to TAIRIS AOA with continuous updates, improvements, and new features
4. Device manufacturer partners licensing TAIRIS AOA to train surgical teams on new products and techniques
MARKET POTENTIAL

Initial market launch (select surgery types)
● Teaching hospitals
● 100,000 surgeries (0.2% annual market capture)
● Industry standard estimate $500/case → $50m revenue/yr

Stage II launch (expanded surgery types)
● Teaching and non-teaching hospitals
● 500,000 surgeries (1% annual market capture)
● Industry standard estimate $500/case → $250m revenue/yr

Peak potential: Redefine the surgical standard of care. Every surgeon, every surgery.
EXPECTED BENEFITS

**Patients:**
- Enhance safety
- Provide novel intraoperative predictors of success
- Improve access to highest caliber surgical care

**Surgeons:**
- Provide real-time decision support
- Enable tailored automated metrics, intelligent guidance, and predictive analytics
- Allow access to surgical collective intelligence

**Health systems:**
- Minimize variability of outcomes
- Reduce surgical costs
- Enhance the overall delivery of surgical care
EXECUTIVE SUMMARY

The Challenge: There are 230 million surgeries performed per year worldwide. Surgical experience is the primary factor dictating outcome of each operation. However, surgical experience is not quantifiable, not accessible as a data source, and not easily distributable between users. This leads to variability in outcomes, complications, inefficiency, and high costs in surgical care delivery.

The Opportunity: What if an artificial intelligence (AI) platform could be designed that would quantify and learn from surgical experience, then customize and distribute tailored information back to all surgeons in real-time?

The Innovation: Our novel platform, which we are calling the Artificial Operative Assistant (AOA), is an Augmented Intelligence system built on a custom deep learning framework with a generalizable and scalable infrastructure. The AOA processes live surgery feeds and presents intelligent guidance and predictive analytics back to surgeons in real-time.

The Market: In the US alone, surgical care is 5% of GDP ($800b) with 50 million operations per year. Based on industry-standard charge estimates, initial goal 1% market capture could generate $250 million revenue per year.

The Potential: The AOA has the transformative potential to redefine state-of-the-art surgical care by enhancing safety, training, & efficiency, introducing novel outcome metrics, improving access, decreasing variability, and lowering costs.