Robotic Telework Software: Enabling Digitalization of Remote Robotic Operations

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VP Commercialization
Outline

- Olis Robotics Company
- Remote Robotics Intervention Trends
  - Variable Autonomy
  - Robotic Telework
  - Living Digital Twins
- Customers of robotic operations information
- Adding value through Analysis
Olis Robotics

- Seattle Based
- Software for Remote Robotic Operations
  - Improve dexterity
  - Reduce risk
  - Increase efficiency
- Core Technologies
  - Living Digital Twins
  - Machine Learning
  - Assistive Robotic Control
Products and Services

**Products**
- Integrated Control Devices
- Control Software for Intervention

**Product Services**
- Training
- Field Service
- Customer Support
- Digitalization

**Engineering Services**
- Application Extensions
- Lead-the-Field Programs
- Joint Development
Olis Corporate Timeline

- 2013: Company Founded
- 2014: NSF Grants
- 2015: BluHaptics
- 2016: Series A
- 2017: NASA Grants
- 2018: First Commercial Revenue
Remote Robotic Intervention Trends

- Variable Autonomy
- Mechanization & Automation
- Robotic Telework
- Robotic Trust Thresholds
- Living Digital Twins
- RoboOps Control Towers
Variable Autonomy

- **Direct Control**
  (no computer assistance)

- **Augmented Control**
  (assisted tasks)

- **Mixed Autonomy**
  (human directs tasks)

- **Full Autonomy**
  (no human assistance)
Robotic Telework

- Remote Piloting Facilities for Offshore Control
- Co-locate expert pilots
  - cross pollination
  - Information sharing
- Resources can be with families
- Reduced costs
Living Digital Twins

- Aggregate
- Query
- Visualize
- Analyze
Building Living Digital Twins

3D Workspace Models
(2D Camera as Sensor)

Localization of Significant Objects
(6 DOF Object Tracking)
Data Focus: Current Industry Norms

- Flight Log data (manual input)
- 2D low definition video capture - archival
- Low resolution scanning sonar
- Flight telemetry data (black box recording)
- Maintenance records

- Manual
- Non-standard
- Labor intensive
- Dispersed systems
The Future With Digital Operations

DATA

DATA

DATA

Processing

Information
Customers of Information

**General Management**
- Informing core business functions
- Operations, sales & distribution, financial, HR etc.

**Partners/Clients**
- Asset management
- Project/program planning & execution

**Operations**
- Logistics
- Scenario based planning & risk management
- Maintenance planning

**Research & Development**
- Value-driven technology roadmaps
- Product development & testing
- Technology integration
Adding Value Through Analysis

**Focus areas**

1. **People**: Who? When? Where? How?
2. **Processes**: How long? Impact? Outcome?
3. **Assets**: How much? How many? Utilization?

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<th>Optimize</th>
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<th>Improve</th>
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<tr>
<td>Profitability</td>
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<td>Training</td>
<td>Downtime</td>
<td>Asset Utilization</td>
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Information: Insights for Clarity of Action

- **People**
  - Real time pilot performance data - *operations evaluation*
  - Operator trend analysis - *training/HR*

- **Processes**
  - Client/Customer specific operations data - *sales/finance*
  - Predictive analytics - *forecasting/risk mgmt*
  - Task/Scenario based performance data - *scheduling/planning*

- **Assets**
  - Asset integrity data (Tactical/Strategic) - *Preventative maintenance*
  - Predictive asset management - *Maintenance/Utilization/Inventory mgmt.*
  - Environmental impact analysis - *Legal/PR*

- Real time
- Autonomous
- Fully integrated
Thank you

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