Towards Autonomous Industries

ROS++

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Autonomy: correct operations over a long duration, without human supervision, while tackling expected and unexpected situations

1. **Spot Known Defects**
   - "This Looks Bad"

2. **Discover Anomalies**
   - "This Doesn’t Look Good"

3. **Predict & Prevent Defects**
   - "Always Good Parts"
Building Blocks for Autonomous Industry
Building Blocks for Autonomous Industry
**Dreaming Beyond ROS**

What can be done to bring ROS-like value to ALL aspects of industrial autonomy?

<table>
<thead>
<tr>
<th>ROS Today</th>
<th>Work in progress</th>
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<tbody>
<tr>
<td>✓ Modularity</td>
<td>▪ Safety concepts</td>
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<tr>
<td>✓ Abstraction</td>
<td>▪ Bridges to other middleware</td>
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<tr>
<td>✓ Connectivity</td>
<td>▪ Optimizations</td>
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<td>✓ Open source</td>
<td>▪ Better algorithms</td>
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Direct or Catalytic Influence on Robotics Domain

**ROS++ for Industrial Autonomy**

- Active bridges to "other" equipment
- Active bridges to IT systems
- Constructs for physical collaborations
- Autonomy Specific Lingo and APIs
- Enhanced vocabulary and ontologies
- Non-programmer UX for deployment
- Robustness to non-ideal channels
- Amenable to orchestration of functions
- Security, Encryption: data, topics, media
- Constructs f/ multi-modal sensor fusion
- On-device persistence of data