

# DA Final: Maintenance Support Using Hybrid Displays

Editor: Andreas Demmel

Supervisor: Prof. Gudrun Klinker, Ph. D.

Advisor: Dipl.-Inf. Björn Schwerdtfeger

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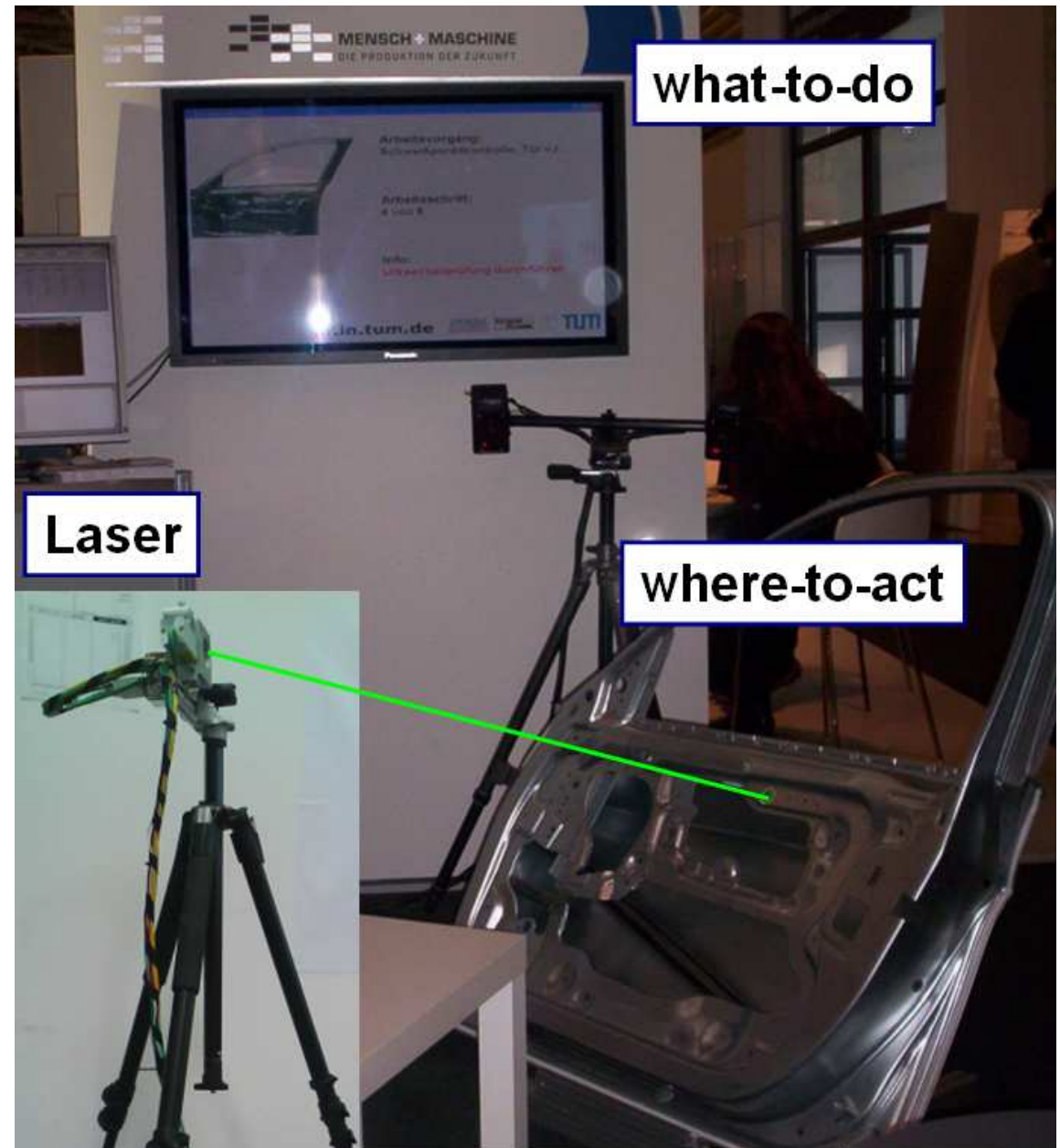


# Content

- Hybrid Display
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- Concept
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# Hybrid Display

- Bases on:  
„Hybrid Information Presentation“  
by Björn Schwerdtfeger
- where-to-act
- what-to-do



# Motivation



# Concept

- Features:

- Immediate Maintenance
- Decrease of Training Level
- Different Instruction Levels
- Shorter Training Period
- Less Service Personnel
- Different Maintenance Levels
- Shared Maintenance Information
- Remote Support with Superior Knowledge
- Data Exchange with Remote Expert
- Telecommanding the WorkFlow Engine
- Override of WorkSteps
- Override of Augmentations
- Worldwide Remote Support
- Remote Training

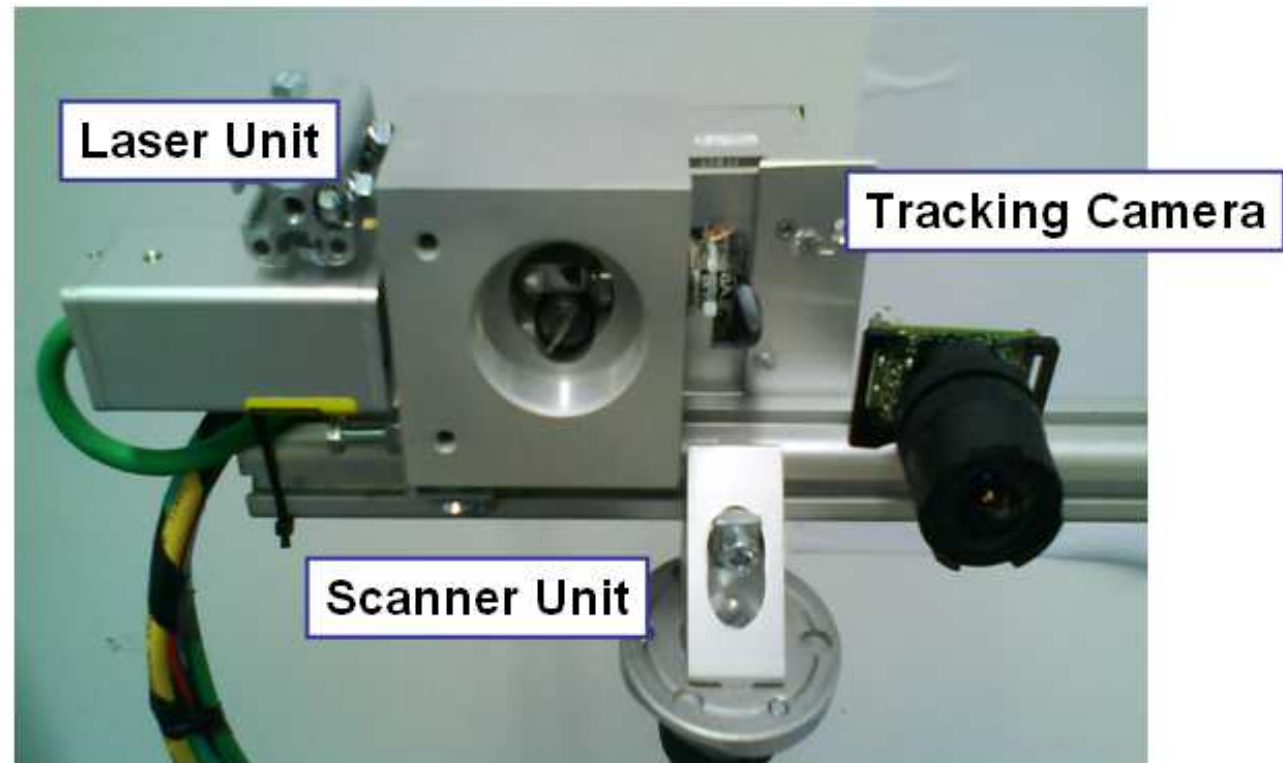
# Concept

- AR-Display Types:
  - HMD for AR-Based Maintenance
  - Laser Projector
  - TabletPC
- Concluded Setup



## Resources

- **Laser Projection Unit**
  - Field of Projection: 46.8°
  - Green Light (532 nm)
  - Power: < 1 mW
  - Laser Class: 2
  
- **Tracking Camera**
  - Fish-Eye Lens
  - Frame Rate: 2-5 fps
  - robust Tracking



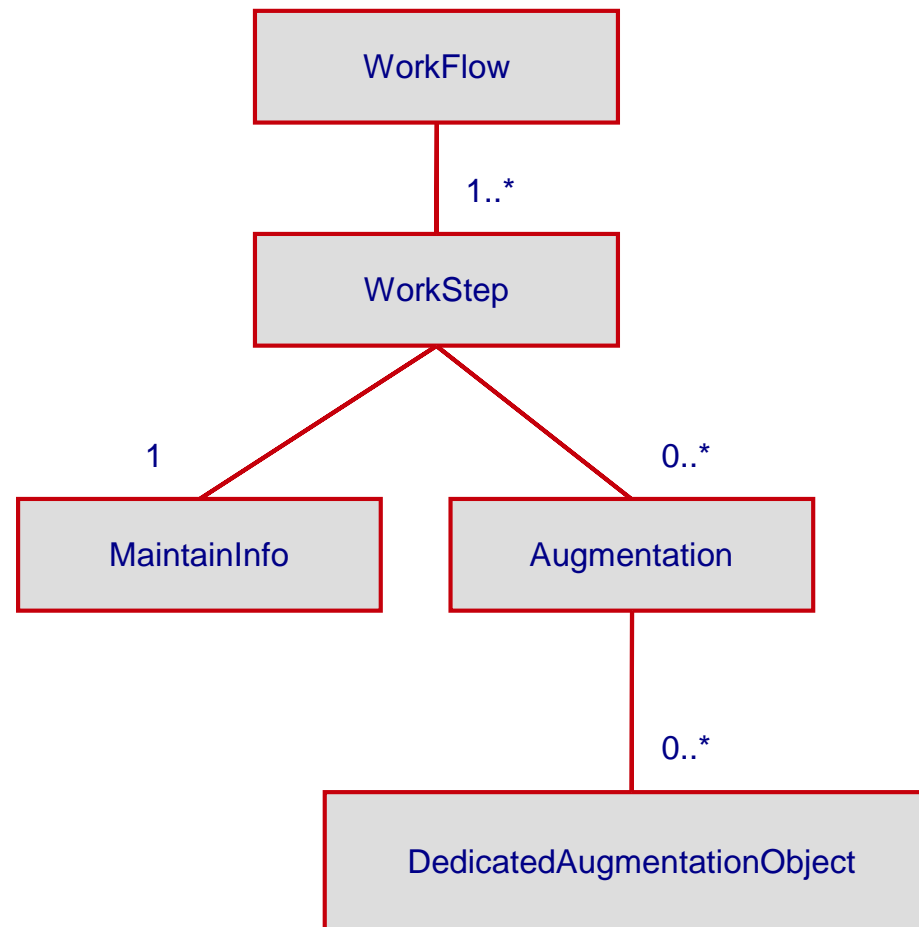
# Resources

- UbiTrack Framework
  
- Simple Component Framework
  - Java-Based
  - Component Framework
  - For Distributed Applications
  - TCP/IP Connection



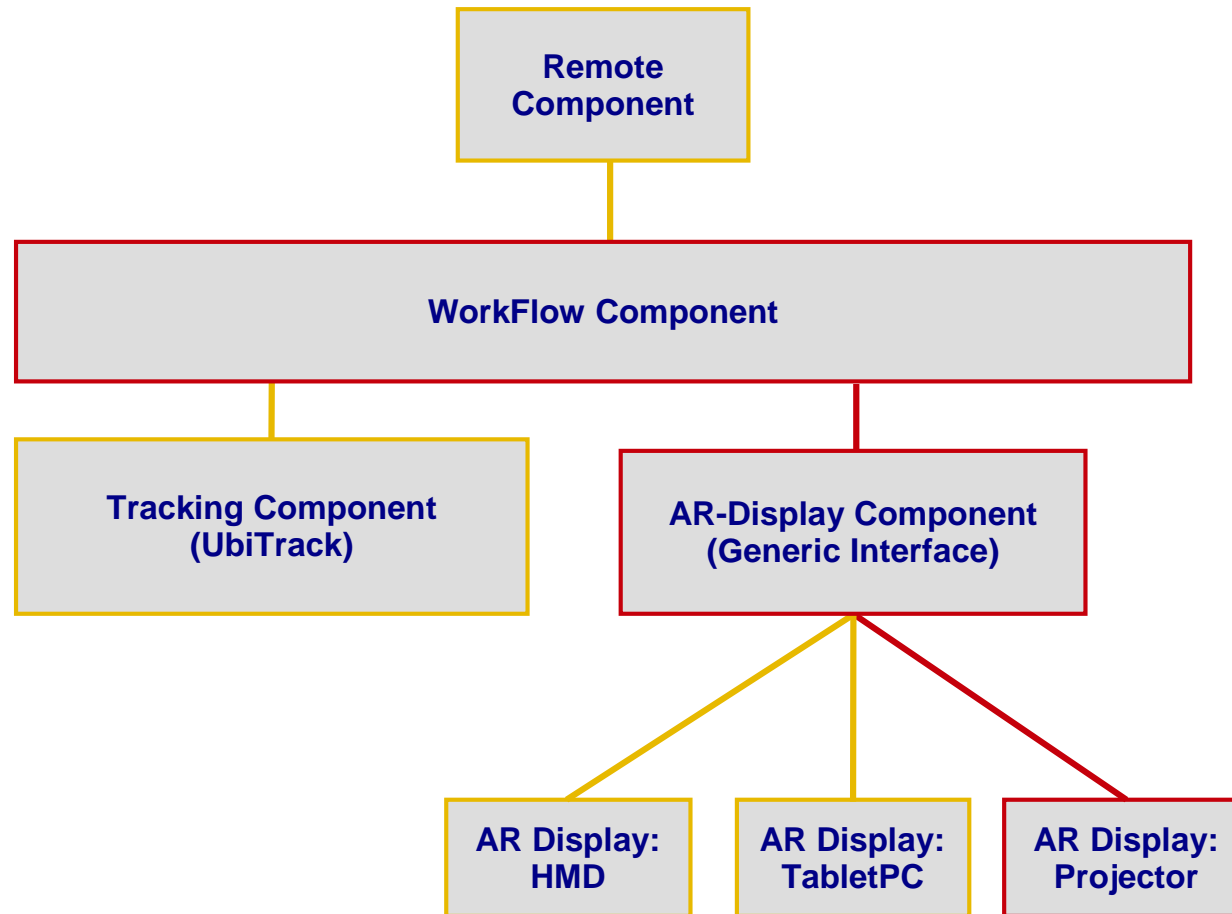
# System Design

- WorkFlow



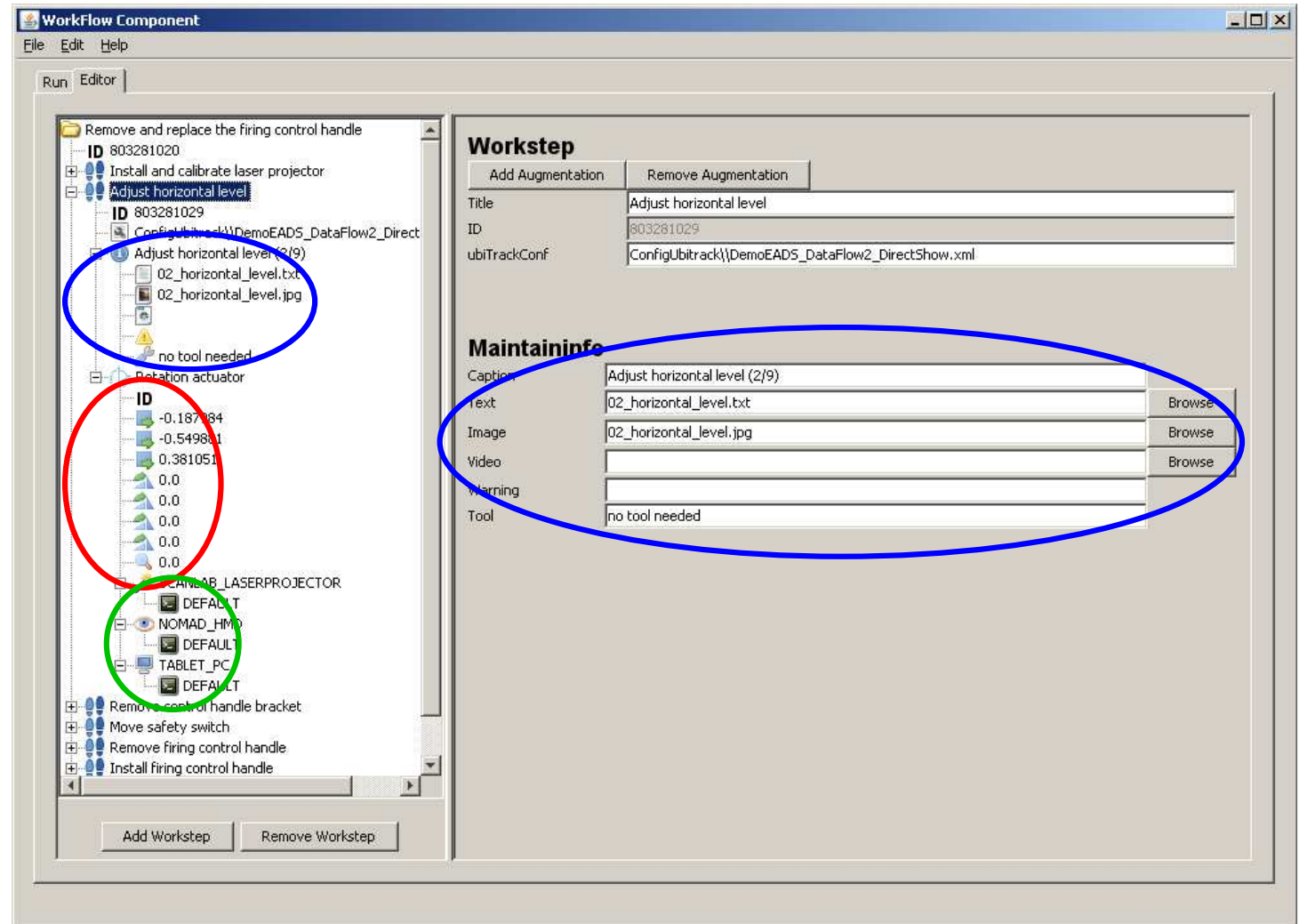
# System Design

- UbiDisp



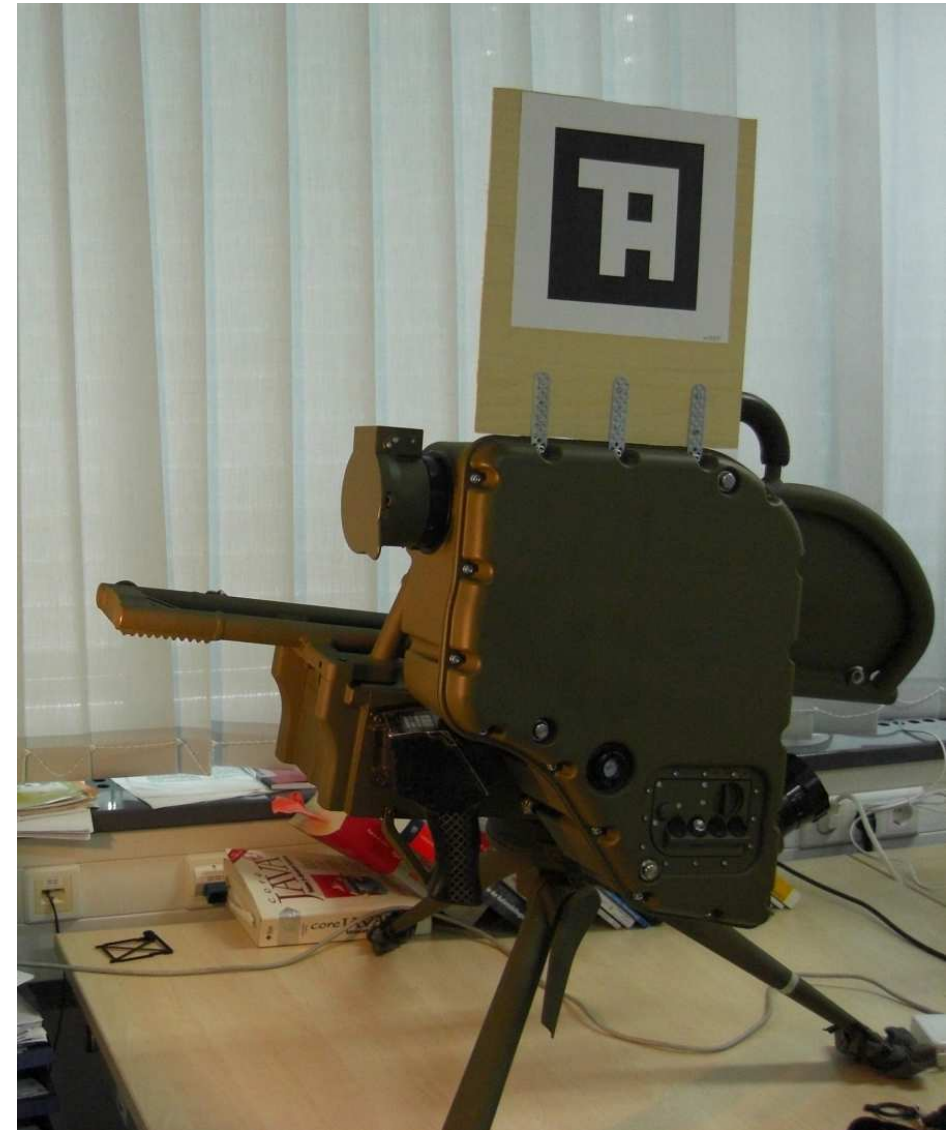
# System Design

- WorkFlow Editor
  - MaintainInfo
  - Augmentation
  - Dedicated Augmentation Object



# Use Case

- Setup
  - Marker Tracking
  - Point Calibration



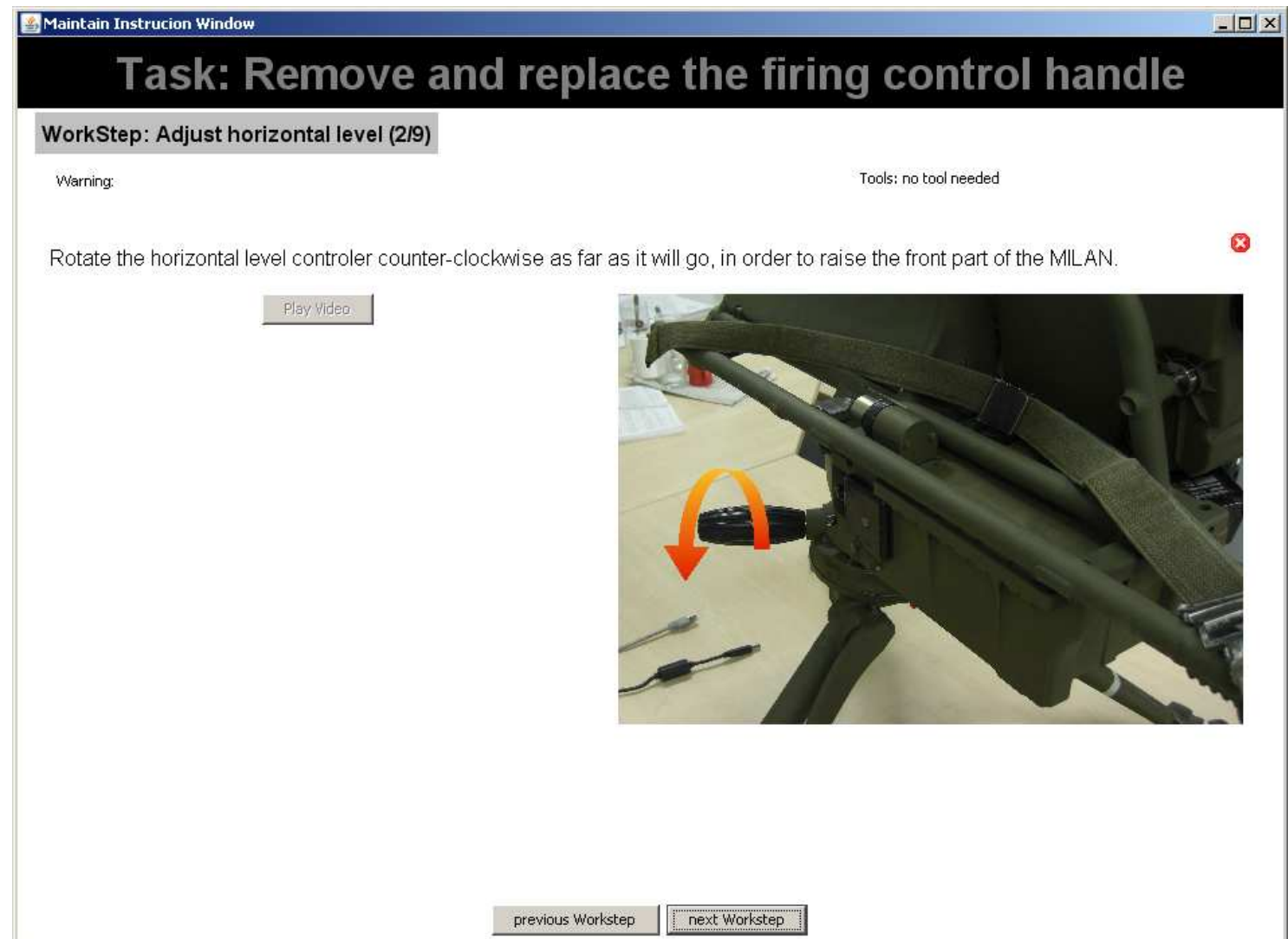
## Use Case

- where-to-act  
Display



# Use Case

- what-to-do Display



## Use Case

- Demo Video

## Conclusion

- Occlusion Problem → Model-based Tracking
- Inadequate Surface → More Powerful Laser, Flashing Symbols
- Good Accuracy
- Clearly Noticeable Symbols
- Intuitive User Guide



# Thanks For Your Attention

Questions?