

2023 GLOBAL CONFERENCE
ON PROCESS SAFETY & BIG DATA



OCTOBER 24 - 25, 2023
DECHEMA HOUSE | Frankfurt am
Main, Germany



The Impacts of Artificial Intelligence & Machine Learning on Cybersecurity and Process Safety



Co-organized by CCPS & EPSC

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Does AI or ML pose risks for process safety or cybersecurity?

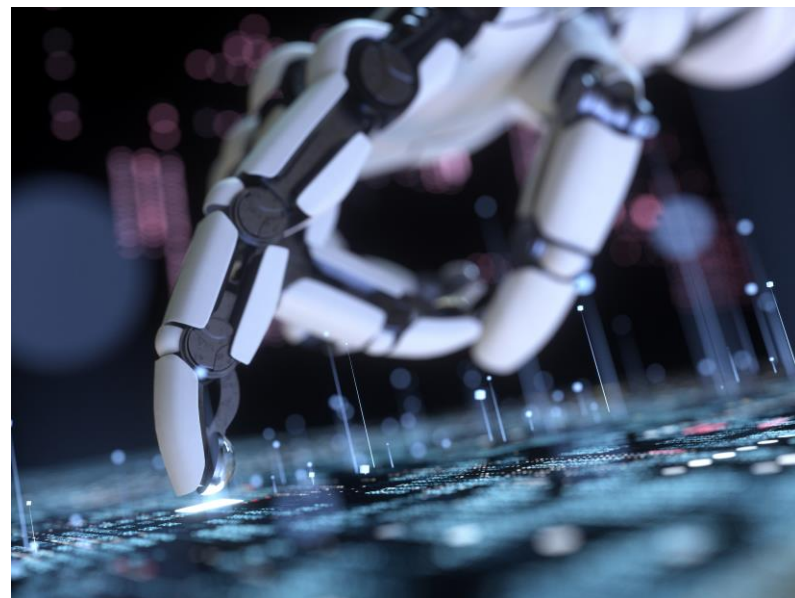
Artificial Intelligence

“The capability of computer systems or algorithms to imitate intelligent human behavior”

Machine Learning

“A computational method that is a subfield of artificial intelligence and that enables a computer to learn to perform tasks by analyzing a large dataset without being explicitly programmed”

- Merriam-Webster Dictionary



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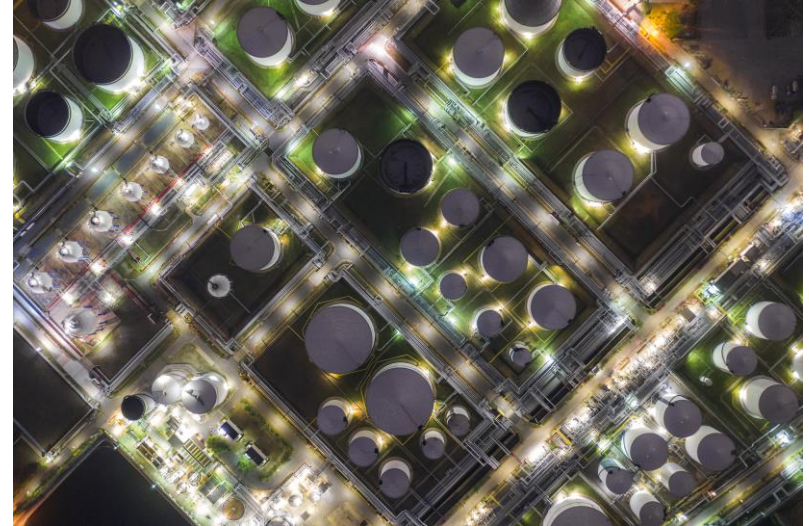


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Artificial Intelligence – Where is it?

- Industrial control systems
 - Advanced Process Control (APC) suites
 - Data historians
 - Cloud- and edge-based data analytics tools
- Business systems
 - Data visualization software
 - Computerized Maintenance Management Systems (CMMS)
 - Industrial data analytics suites
- Risk assessment tools



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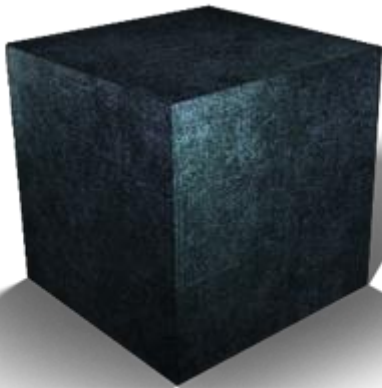
Artificial Intelligence – Where could it be?

- Industrial control systems
 - Industrial sensors and instrumentation
 - Real-time automated operating procedures
 - On-controller self-optimization tools
- Business systems
 - Dynamic employee work scheduling
 - Root Cause Failure Analysis (RCFA) and Failure Modes and Effects Analysis (FMEA)
 - Staff- and skill-augmentation
- Risk assessment tools





Pitfalls of Artificial Intelligence



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Pitfalls of Artificial Intelligence



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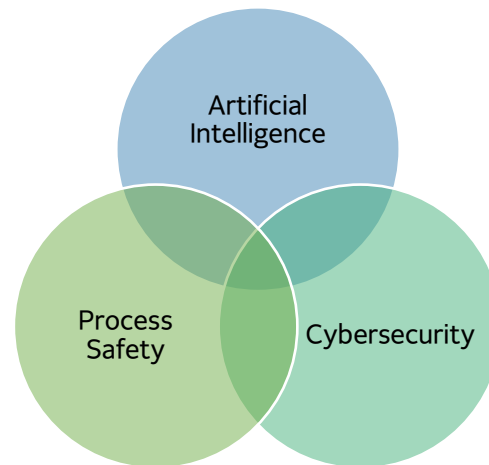
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AI's Impact on Cybersecurity & Process Safety

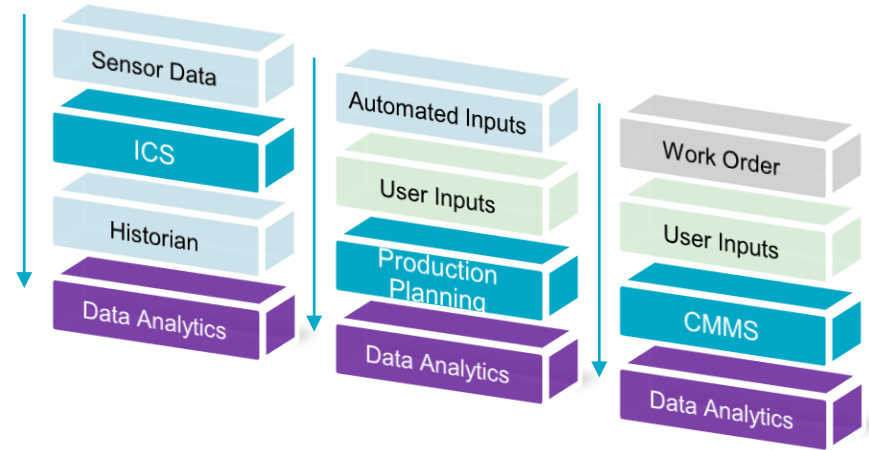


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Industrial Data Analytics Suite

- Pulls in and analyzes data from multiple sources
 - Industrial Control Systems (ICS)
 - Production planning tools
 - Computerized Maintenance Management Systems (CMMS)

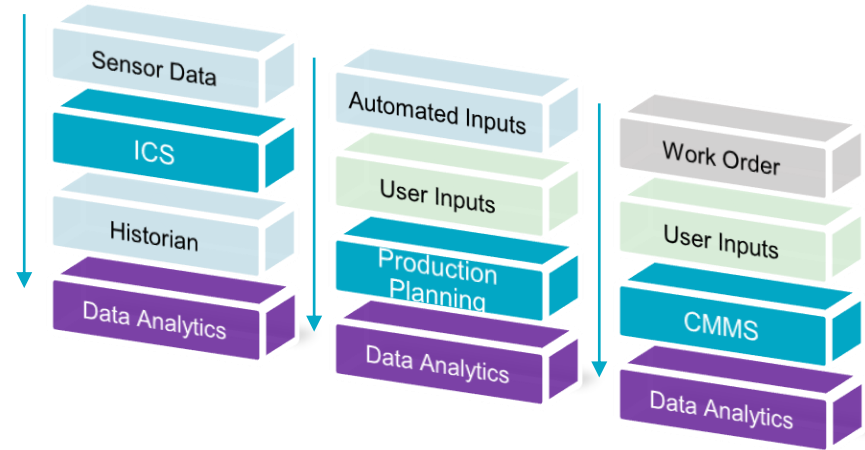




Industrial Data Analytics Suite

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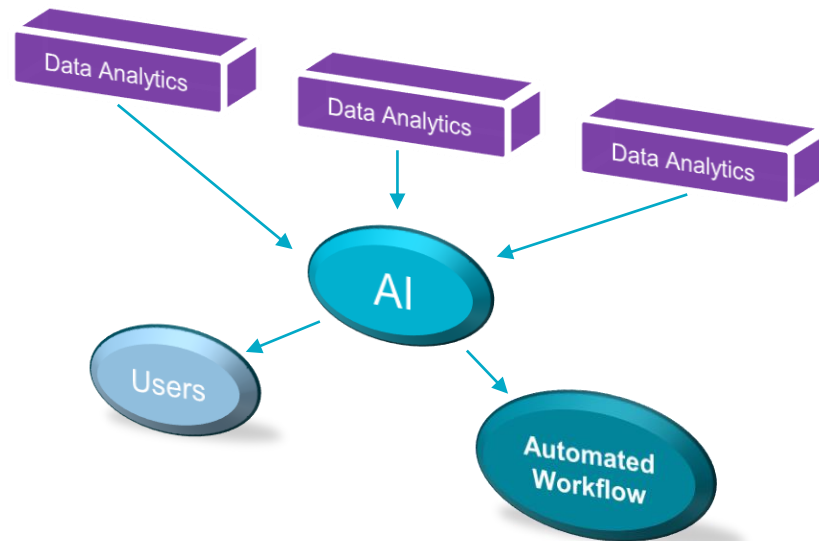


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Industrial Data Analytics Suite

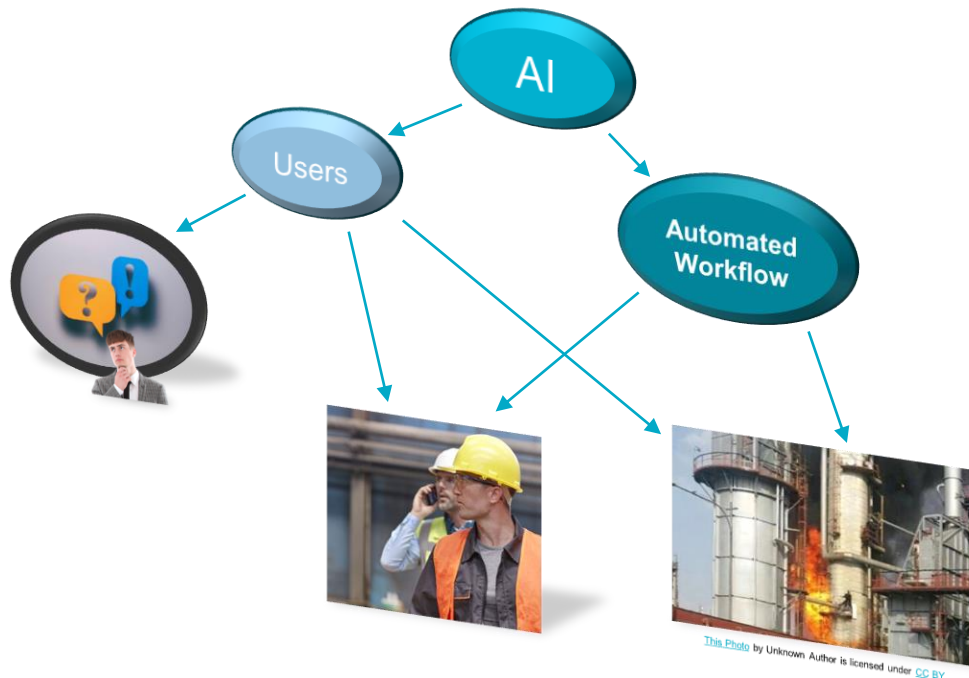
- Multiple sources
- Multiple users





Industrial Data Analytics Suite

- Multiple users
- Multiple potential results
 - They could be benign
 - They could be disruptive
 - They could be catastrophic

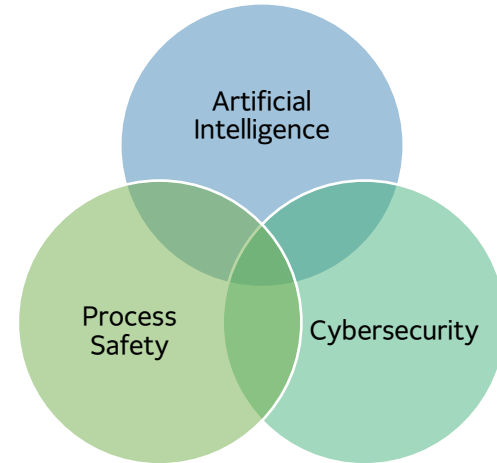




Organizations Considering AI

Thoroughly understand:

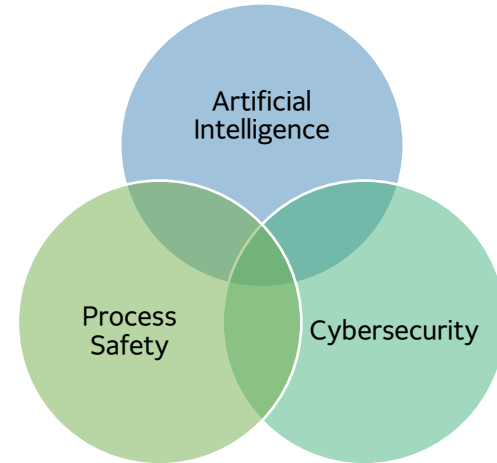
- How AI functions
- How AI needs to be maintained
- How AI fits into your operational structure
- How to put safeguards around AI's functionality





As the organization starts implementing AI

- Include cybersecurity and AI in process safety reviews
 - Capture potential touchpoints where a system could be affected by AI or a cyber attack and impact process safety
 - Capture overlap between programs to understand program requirements, work processes, and personnel responsibilities
- Conduct process safety assessments
- Properly train all personnel
- Make sure to include Operational Technology (OT) and ICS



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What are solutions?

• Cybersecurity Assessments

- Develop a robust, functional, enterprise-wide cybersecurity program
- Conduct cybersecurity risk assessments: the Cyber PHA
- Conduct routine cybersecurity program audits
- Conduct cyber vulnerability assessments

• Process Safety Assessments

- Consider the process safety risks of AI/ML applications
- Conduct PHAs focused on risks of AI/ML applications
- Conduct routine audits & assessments

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