

Digital Integration Centre of Excellence (DICE)

Saskatchewan Polytechnic

📍 Saskatoon, SK



ABOUT DICE

The Digital Integration Centre of Excellence (DICE) is a research lab within Saskatchewan Polytechnic's School of Information and Communication Technology. We work collaboratively with multiple programs to bring digital solutions for our various industrial partners. Our core focus is on data. This involves data integrity, the transmission thereof, along with analysis and storage aspects.

Within this focus, we look at three different aspects of how data interacts within an organization.

Asset Management and Monitoring

In addition to traditional definitions of an asset, DICE includes data as an important corporate asset. By combining data acquisition, distributed analytics, edge computing, mobile computing, and software technology platforms, companies have access to condition monitoring, along with analysis and predictive capabilities.

Time-Sensitive Networking (TSN)

TSN is a key component for various industrial applications such as process and machine control. To be able to manage a system to create low communication latency and minimal jitter are critical for closed loop requirements. DICE helps to demonstrate technologies from multiple companies working together on a TSN network to showcase flexible manufacturing and processing scenarios.

Mesh Communication and Control

A mesh refers to a rich interconnection among smart devices or nodes consisting of mesh clients, mesh routers and gateways in a relatively stable topology. DICE focuses on open technologies that can help monitor and control mesh networks at the cloud edge, while maintaining scalability and interoperability between different vendors and protocol standards. This allows companies to increase resiliency and make integration of distributed resources easier.



Digital Integration Centre of Excellence



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RESEARCH AND INNOVATION EXPERTISE

EXPERTISE

1. Concept Validation
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6. Network Analysis
7. Prototype Development
8. Proof of Concept
9. Software Design and Project Management
10. IoT Sensor Integration
11. Predictive Maintenance
12. Data Integration
13. AI / ML / Depth Learning
14. Customized Training
15. Drone / Autonomous Vehicle Development
16. Virtual, Mixed and Augmented Reality
17. Software Re-Design and Improvement
18. Cyber Security

Previous Research Projects

- Prototype platform using augmented reality to help facilitate knowledge exchange in a large outdoor agricultural expo
- Augmented reality prototype for tourism in remote locations
- Open source tool that performs automated penetration testing along with suggested solutions
- Prototype system to help support individuals in mental wellness through peer support
- Design and testing of machine learning technologies on assembly line data to decrease incidence of faulty parts
- Prototype mesh network to allow accurate positioning in underground environments
- Development of a prototype platform for canine simulation training
- Development of a prototype platform for identifying weeds in a crop using AI

Fields of projects

- Agriculture
- Precision Agriculture
- Agriculture Artificial Intelligence
- Food processing
- Fleet Monitoring/Maintenance
- Mining
- Artificial Intelligence
- Mining Process Optimization
- Mining IIoT
- Mining AI Analytics
- Health care
- Mental Wellness
- Education
- Automotive- Analytics
- Industry Education

