Slide 1 (2 min)

Introduction to Autonomous Systems

- Definition of AS
- Technological benefits
- Critical Technologies

Autonomous systems, DP Watson, DH Scheidt - Johns Hopkins APL technical digest, 2005 - jhuapl.edu

Slide 2 (1 min)

Integration of AS with Modern Computing

- Integration with IoT
- Integration with Big Data
- Integration with ML

Integrations between autonomous systems and modern computing techniques: a mini review, J Chen, M Abbod, JS Shieh - Sensors, 2019 - mdpi.com

Slide 3 (2 min)

Potential advantages of using ML

- Algorithms for difficult learning tasks
- Models for sensing problems
- Solutions for control problems

Machine learning with applications to autonomous systems, X Xu, H He, D Zhao, S Sun, L Busoniu, SX Yang - 2015 - digitalcommons.uri.edu

Slide 4 (2 min)

Federated Learning

- What is Federated Learning
- How the Federated Learning works
- Advantages for Autonomous Systems

Integrations between autonomous systems and modern computing techniques: a mini review, J Chen, M Abbod, JS Shieh - Sensors, 2019 - mdpi.com

Slide 5 (1 min)

Introduction to next topics

- Non functional requirements that need special attention (Safety)
- Phases of development that need attention (Reliability study, Testing)

Slide 6 (2 min)

Safety-assurance design

- Possible problems (adversarial attacks, timing, ...)
- Possible solutions

Safety-assured design and adaptation of learning-enabled autonomous systems, Q Zhu, C Huang, R Jiao, S Lan, H Liang, X Liu… - Proceedings of the 26th …, 2021 - dl.acm.org

Slide 7 (3 min)

AMLAS

- What is AMLAS and what is its aim
- How is structured AMLAS

- Overview of the stages

Guidance on the assurance of machine learning in autonomous systems (AMLAS), R Hawkins, C Paterson, C Picardi, Y Jia… - arXiv preprint arXiv …, 2021 - arxiv.org

Slide 8 (2 min)

Testing and Reliability changes

- Why testing is different with the introduction of Machine Learning
- Why Reliability changes with ML

Software and system reliability engineering for autonomous systems incorporating machine learning, A Gula, C Ellis, S Bhattacharya… - 2020 Annual Reliability …, 2020