

# 5G-FORCE AI Group

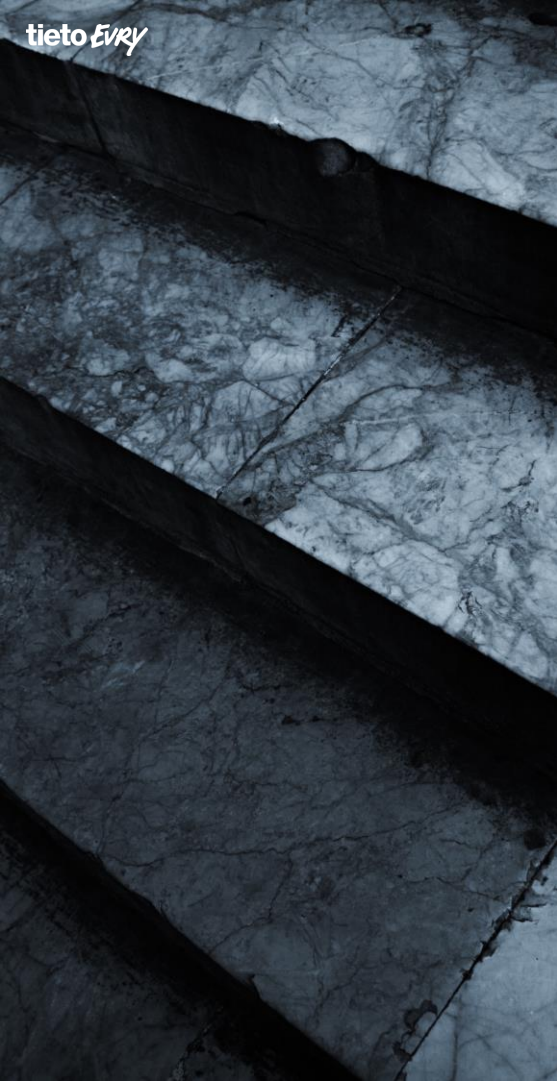
---

Iftikhar Ahmad (PhD)

TietoEvry Oy

27.01.2021





## AI Group Activity

- Discussion in 5GTNF
  - AI Group Meetings
- 1-on-1 Meeting
- Proof of Value (POV)
- Collaboration with Intel
  - **OpenNESS on 5G**
- 5G mesh network in
  - Smart City
  - **Automobile**
  - **Healthcare and wellbeing**
- Intel OpenVINO on Edge
  - Smart City
- Combining 5G & Edge
  - **Intel OpenNESS**
  - **Intel OpenVINO**

# Machine Learning (ML) in WP4

## ML life cycle management

- Governance of machine learning
- Deployment and tracking
- POC NOT ENOUGH
- Prove of value (POV)
- Create value MAP
- Change tracking
- Monitoring concept and data drift
- Continues integration and continues development (CI/CD)

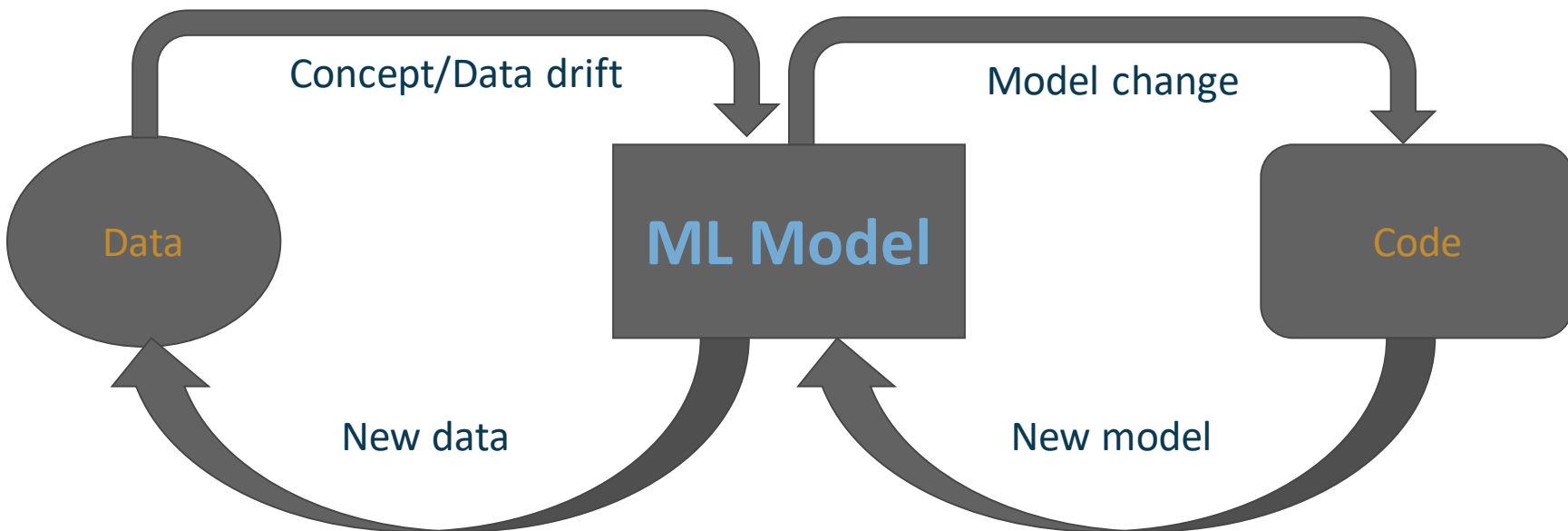
## ML model management

- Development
  - Training
  - Stability, robustness
  - Security and safety
- Deployment
  - Reproducibility
  - Validation
  - Retraining
  - Versioning
  - Transparency and fairness

## ML operations

- Development and deployment
- Redundancy (running parallel models)
- Incremental training
- Data and concept drift
- APIs bindings
- Monitoring
- Validating

# Machine Learning Life Cycle Management (Study)







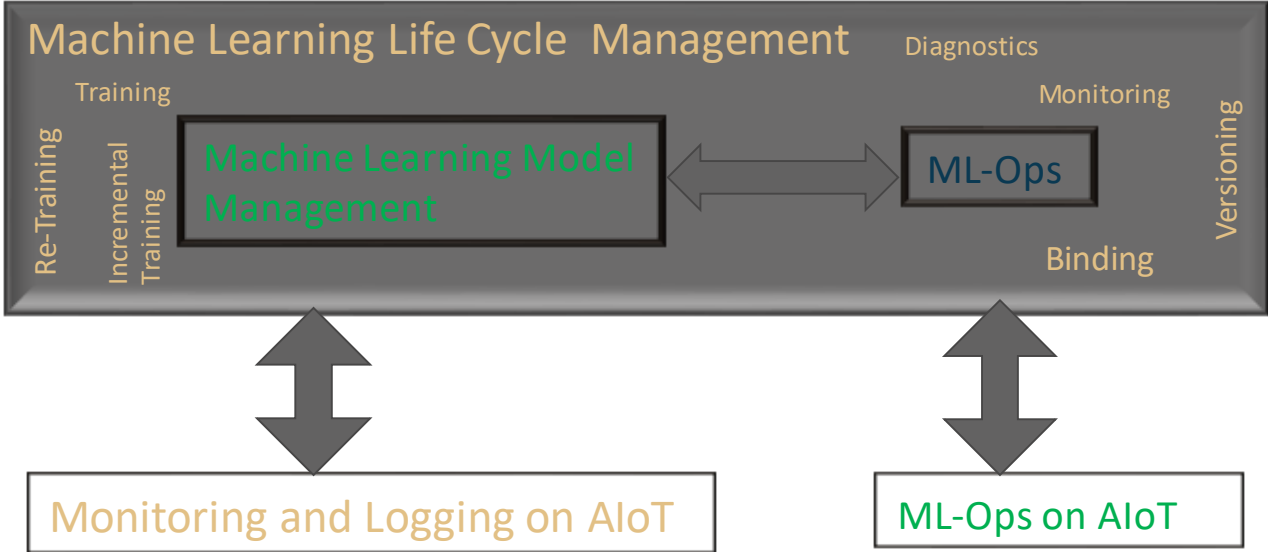
# ML-Ops for Data and Concept Drift

- Model drift
  - Device require updates
  - New devices added (new data)
- Concept drift
  - Device removed or not available
- Monitoring
  - Automatic re-training
    - Incremental training
  - Model update
    - Retraining
  - Validation



5G-Force

# Machine Learning Life Cycle Management



5G-Force

---

## ML-Ops (1/2)

- Increase automation
- Communication and collaboration
- Improve production quality
- Integration between development cycle and production
- Rapid innovation
- Deployed in range of devices
- Specialized according to devices, low latency
- Privacy, security
- Ethical AI



## 5G-Force

---

# ML-Ops (2/2)

- Development and automation
- Reliability
- Diagnostics
- Scalability
- Monitoring and management
- Bridge gap between data scientist and IT teams
- Reproducible ML pipeline
- Ethical AI external auditing
- Human AI co-operation (Domain experts)



# [Link: Intel awards TietoEVERY for accelerating 5G and virtual network transformation | TietoEVERY](#)

[Newsroom](#) > [All news and releases](#)

A photograph of a residential neighborhood with various houses and a tall communication tower in the background under a clear sky.

## Intel awards TietoEVERY for accelerating 5G and virtual network transformation

TietoEVERY recognized as a Solution Plus Partner in the Intel® Network Builders Winners' Circle program.

## [Link: Intel awards TietoEVERY for accelerating 5G and virtual network transformation | TietoEVERY](#)

“We are excited to be part of this ecosystem and work with the world’s most advanced global technology companies’ software development for 5G networks, connected and autonomous cars and smart devices – the 5G revolution calls for cross-industry collaboration. To facilitate solution productization, we leverage our 30 years footprint in telecom networking, a strong understanding of industry ecosystem dynamics and technical expertise on open source, reference architectures, integration, augmentation and optimization,” says **Harri Salomaa**, Head of Product Development Services, TietoEVERY.

The recognition is the third consecutive one for TietoEVERY.

TietoEVERY works with companies to adopt and commercialize solutions based on Intel's hardware and reference architectures. Some examples are:

- Innovative 5G and edge solutions utilizing Intel's FlexRAN for virtualized RAN/ORAN
- OpenNESS for Cloud-Native optimized edge orchestration
- Container kits for Cloud-Native infrastructure acceleration
- Edge AI use cases such as SmartCity video analytics using Intel's OpenVino framework