Challenges and Opportunities Towards a truly Autonomous Network

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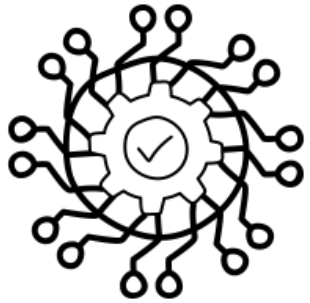
Telco AI is slowly rising

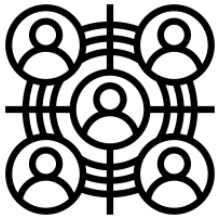
- Interpret and understand the visual world
- Interaction between data science and human language
- Creativity in painting, music, and video

- But AI implementations are slowly picking up in the telco domain…

Telco needs AI, Telco knows AI, Telco has DATA…

- Complexity is increasing with 5G and beyond
- Many non-network use-cases are already deployed
  - Churn prediction, customer segmentation, community heatmaps, up-sale/cross-sale, fraud prediction, …
- Network related use cases are slowly picking-up
  - SON, traffic forecasting, load balancing, RCA, …





Why slow?

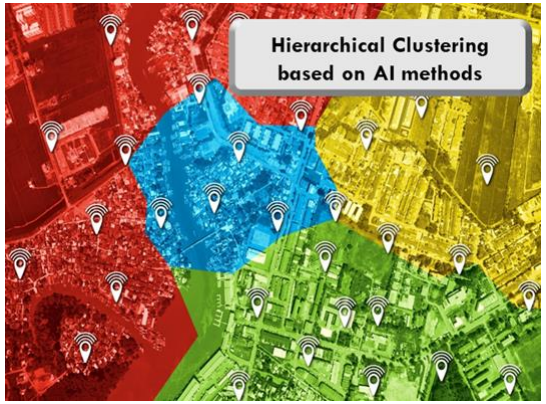
- Limited resources
- Real-time applications are difficulty on centralized architectures
- Non-standard interfaces forces vendor specific developments
- Lack of evaluation directions and evolution path
- Non-transparency and lack of trust

What Telcos need?

- AI-ready architectural design that supports interoperability, data handling mechanisms, tools to evaluate network maturity, and trustworthy deployments of AI algorithms in this journey
- FG-ML5G ML specs for future networks
  - **ITU-T Y.3172**: Architectural framework
  - **ITU-T Y.3174**: Framework for data handling to enable ML
  - **ITU-T Y.3173:** Framework for evaluating intelligence level

Turkcell AI-based Network Automation

- Centralized SON is deployed since 2016 in a multi-vendor, multi-technology environment
- Takes >220K daily actions for more than 500K active cells
- AI-based network automation in 2019



AI-based Network Automation Use Cases

Predictive **energy saving**	**3.6%** reduction in RAN power consumption
Customer centric **coverage & capacity** management	**17%** more users experienced better streaming
Predictive network traffic **load balancing**	**42%** more corrective capacity actions are taken **2.4%** RAN CAPEX savings

Turkcell

Radio Link Failure Prediction Challenge

Turkcell is submitting a problem statement to the **ITU Artificial Intelligence/Machine Learning in 5G Challenge**, a competition which is scheduled to run from now until December, 2020. Participation in the Challenge is free of charge and open to all interested parties from countries that are members of ITU.

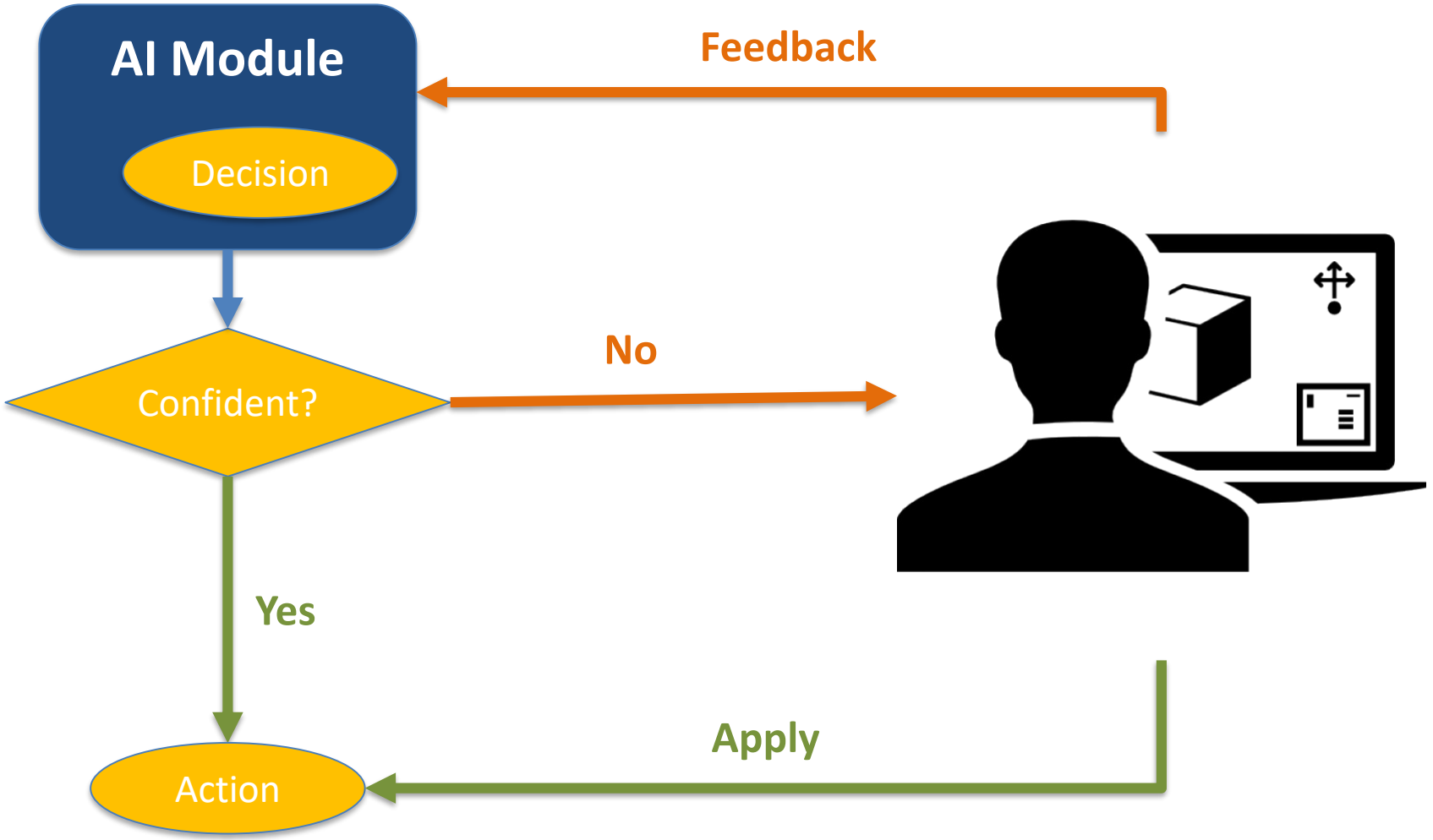
Detailed information about it can be found on the Challenge website, which includes the document "ITU AI/ML 5G Challenge: Participation Guidelines".

Radio Link Failure Prediction Challenge is organized as a part of ITU AI/ML in 5G Challenge.

Dilemma for mission critical services

- Want **best** possible **accuracy** *but* **trust** and **validation** is of utmost importance
- Prefer simpler yet explainable models to complex but more accurate ones
- With improved AI explainability, no need to compromise performance

Deploying AI modules with a piece of mind…



Fast adaptation, quick model updates

- Distributed learning allows on-time analysis and decision making
- Transfer learning allows training models with few examples
- Domain knowledge applied to new scenarios

Conclusion

- AI is slowly moving to become mainstream in the telco domain
- There are some challenges to be overcome and new research directions to be explored to make this happen
- Standardization is the key enabler

Thanks

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