87TH IFIP WG 10.4 MEETING

SUMMARY FOR SESSION 2 - INDUSTRY ROADMAP FOR MISSION-CRITICAL USE CASES

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TALK 1: THE MINE OF THE FUTURE: VISION, USE CASES AND TECHNOLOGY ROADMAP

- Luccas Britto, Bruno Jesus (Vale)
- Vale's ambitions
  - Understanding the technical parts in addition to the vision
  - Sustainable
  - Referencing and sharing values
  - Should automate solutions
- Need to have good relations with the community: Transform to the future together
- Technology being the central
  - Pillar technologies
  - Preliminary opportunities (Carbon-capture, etc.)
- Nokia cognitive digital mine (CDM)
  - CDM smart operations

TALK 1 (CONT.)

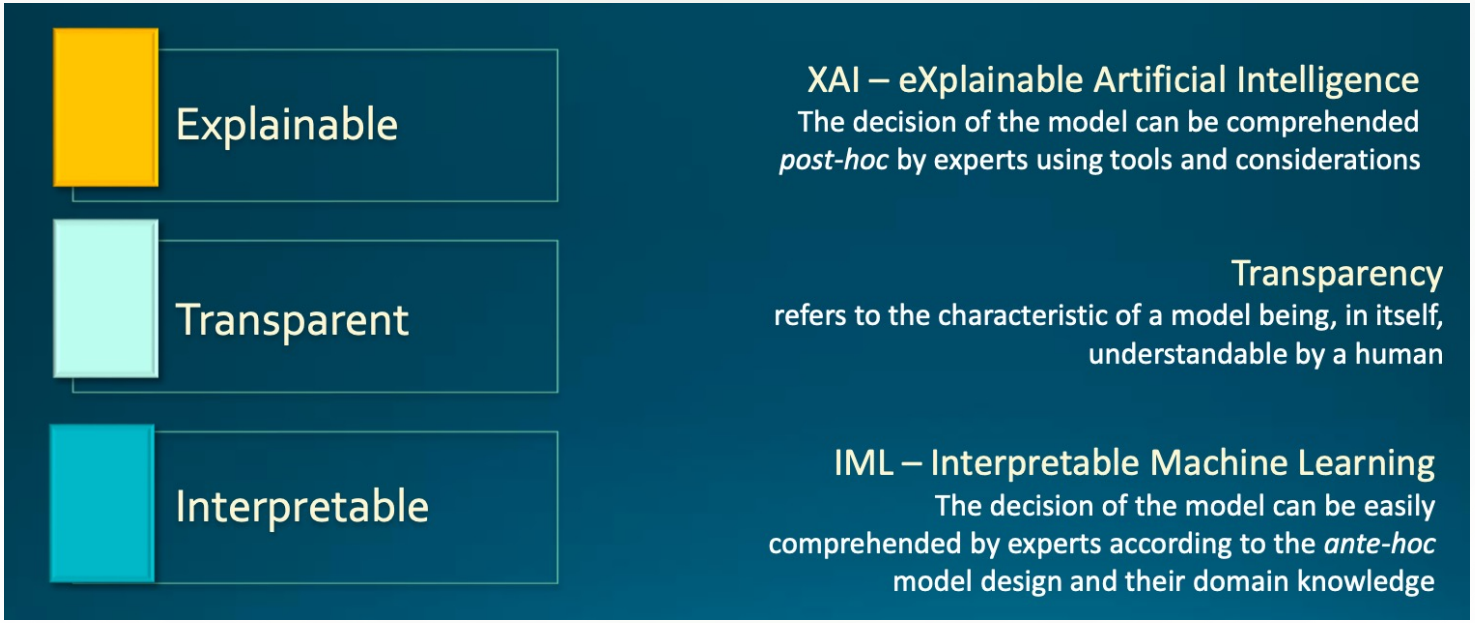
- Discussions
  - The community worry about danger and safety associated with new use cases and new technologies. How to deal with them?
    - Need to integrate the systems together.
  - Now with AI how can we track those data and make sure the specific machine won't fail?
    - Try to make systems more predictive, and use corrective operations.
    - Design AI strategies for operations, and design systems for prevention of dangers.

TALK 2: CRITICAL AND NON-CRITICAL AI APPLICATIONS: THE NEED FOR INTERPRETABILITY ISSUES

- Giovanni Moura de Holanda (Fitec)
- Fitec: a company of foundation for integration technology, with 30 years of experience
- What is mission-critical application in terms of AI? Directly associated with society safety.
  - Critical services (high risk) with high algorithmic impact
  - Autonomous vehicles
  - Diagnosis and medical procedures
  - Management and operation of critical infrastructures (transit, water and energy supply networks)
  - Support for the administration of justice and law
  - Assessment of access criteria to essential services
  - Support logistics for emergency services, such as firefighters and emergency services
  - Biometric identification
- Important but Non-critical applications
  - Translations
  - Some decisions/recommendations
  - Computer vision for identifying and classifying objects
  - Predictive analysis for power performance
  - AI-based fault detection
  - Immersive experiences

TALK 2 (CONT.)

- For AI to work in critical and important non-critical applications
  - Interpretability is needed



TALK 2 (CONT.)

- Some FITec AI projects
  - IoT energy, ML identification/inspection, production control, digital transformation, chatbot
    - Prediction (biased or unbiased, policy related, etc.)
    - We should understand how the system makes the decision
- Discussions
  - Attendees mostly agree that critical applications are usually associated with safety.
  - But are LLMs safety-critical?
    - Some argue that LLMs may be safety-critical as they may persuade people to do bad things (e.g. suicide).
    - Some argue that LLMs are not critical applications: differentiating the criticality of the application and the AI model/technology
      - When chatGPT is used for critical application for example teaching students, the application is critical but the GPT model itself is not.
  - If a human is in the loop, then the interpretability is a problem. But if a human is not in the loop, is interpretability still a problem?
    - Maybe not a problem in such scenarios?
    - For certain scenarios where we need human operations, the interpretability is definitely important and needed.
  - Data quality is important for AI. But data quality is not easy to check
    - E.g. poisoning data is not easy to detect, not straightforward to see
    - Traceability of data may be important and helpful in ensuring/enhancing data quality.

TALK 3: STRATEGIC PARTNERSHIP FOR INNOVATION: 5G LAB, LET5GO AND CRITICAL TECH INITIATIVES

- Irineu Mario Colombo, Jose Alberto Pereira dos Santos (Itaipú Parquetec)
- 5GLab
  - Utilize the physical facilities of Itaipu Parquetec to develop technical solutions using 5G technology and experimentally evaluate conceptual use cases for the power plant through Technological Orders (ETECs), enabling a 5G technology infrastructure..
- Let5Go Public Call
  - Promote the development of sustainable and efficient solutions, strengthen the startup ecosystem, and drive economic and social benefits for the region and the country.
  - Participating companies (in the right)

- The Critical Tech Project
  - Implementing use cases and technical applications for testing and validation of private 5G networks in industrial environments, creating business models that make them viable for Brazilian industries.
  - Basically, with 5G working, what can we do?

TALK 3 (CONT.)

- Use cases and applications in the Critical Tech Project

USE CASES	TECHNICAL APPLICATIONS
A.1) 360 Mapping the Pilot Plant with Metadata (Using 5G)	B1) Comparing the performance between Wi-Fi, 5G e 4G networks
A.2) Detection of thermal differences in components in the Pilot Plant (Using 5G)	B2) 1 day of autonomous inspection routine with 5G (with Demo) showing inspection potential and coverage
	C1) Execution of a demonstration mission of the non-native AI of the SPOT robot (LEVATAS), performing streaming for mission monitoring (Teams)

TALK 3 (CONT.)

- Discussions
  - 5G is expensive. What is good in 5G, particularly compared with wifi?
    - There are scenarios where wifi cannot apply. In other scenarios we can use wifi.
  - Shall my computer application be aware I am using wifi or 5G?
    - Typically not.
  - The installation/deployment of 5G involves a lot of devices and infrastructures, and hence it is expensive