

# Status of the AI research challenges document

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# June meeting

- Dedicated meeting to
  - Freeze the challenge list
  - Set the expected content type and levels of details for challenges → template
  - Define one lead contributor per challenge (has continued through email interaction)
  - Set milestones for progressing on the document
- Release of v3 (integrated comments): [https://docs.google.com/document/d/1I9Z3MiwqdY\\_CkQI5yWpyKRTvIYjeDqWM5fDIZQ\\_K63o/edit](https://docs.google.com/document/d/1I9Z3MiwqdY_CkQI5yWpyKRTvIYjeDqWM5fDIZQ_K63o/edit)  
(do not edit v2 anymore)

# Template

- Keep a coherent and fixed level of details across challenges
- Use the same organization □ Easier to merge/split challenge if needed

## 1. Motivation

- Highlight the criticality/impact of the problem to be addressed

## 2. Current SotA

- current proposals / trends based on reference/survey

## 3. Detailed description of the sub(challenges) □ one challenge can lead to multiple problems to be solved

- Highlight what are the remaining issues to be resolved from the previous SotA
- Can include some existing propositions (if any)

- + need to highlight NM-specific issues/challenges

# Major updates in the listed challenges

- All challenges regarding data grouped under the data management challenge
  - Data access, collection, sharing, knowledge extraction, feature engineering
- No IBN specific challenge
  - AI for planning actions (not only in the case of IBN)
  - Interpretation of intents □ exploitation of non technical / high-level data

# Challenges

	Motivation	Advances / SotA	(Sub)challenge description	Comment
Lightweight AI	X	X	X	
Data management	X	X	X	need for inputs regarding anonymization techniques
Problem type and mapping	~			X
Human in the loop				
Acceptability of AI for NM				
Automated network data labelling	X			To be included in data management (need to be refined)
Online monitoring and control of the quality and properties of estimators	X			
AI for planning of actions			X	Must be completed and rephrased independently of IBN
Exploiting External and non technical Events	X			Challenge descriptions have been merged but need to be integrated
Commercialization of AI-based products	X	X	X	Generalization and usability of trained model □ title should be changed
Explainability of Network-AI products	X	X	X	
Generating networks for tests, experimental studies,...	X			
Scalable and Practical Forecasting Models	X		~	Merge with “Online monitoring and control of the quality and properties of estimators” ?

# Progress in last month

- **Data management**

- Large coverage / multi-faceted challenge → try to follow an abstract representation of the data analysis pipeline to highlight the different subchallenges
  - Definition of data to be collected or feature to be derived
  - Data collection mechanisms (do we have all necessary enablers?)
  - Optimization of collecting data (filtering, aggregation, real-time considerations...)
  - Flexible and customizable monitoring information (network telemetry)
  - Need for labelled data (data sharing and anonymization)
  - Security and privacy aspects
  - Also include challenge related to the use of network monitoring to provide data for AI (should it be kept separately?)

- **Commercialization of AI-based products** = where does this training occur?

- Generalization of a model trained in a lab (how to transfer and so how to commercialize an “AI”)
- Two orientations for problem solving: transfer learning, Graph Neural Networks (GNNs)

- **Explainability of Network-AI products**

- Blackbox approach → hard to offer guarantee on the performance of the AI
- [NM-specific] networking usually rely on procedure and algorithms with clear performance guarantees and troubleshooting mechanisms
- Recent propositions exist to explain how a predictor took a decision
- Digital Twins of the network that are reversely explored to explain some output from the ML mode

# Next steps

- 4 challenges have already a well-detailed description
  - Review / refinement until end of August
  - Editorial sessions?
    - One per challenge
  - Serve as template for the description of other challenges
- Move to an ID in September
  - Visibility in datatracker
  - Common format
  - Use of gituhb?
    - Versioning
    - Discussions in issue tracker will be also easier to follow