Research Challenges in AI for NM document

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Status 1/2

- https://docs.google.com/document/d/1dQOzZustI2mkYr_omtiqu3FqUvoqLgaCp7nbRj4ZJyw/edit?usp=sharing
- Thanks to the (future) contributors : 7+ contributors

- Introduction / motivation of the document
    - Difficult problems in NM (where AI can help) before objectives of IA in NM (new proposed section)
        - Scalability / accurate issues with heuristics techniques (NP-hard problems)
        - Bottleneck of human-based operations
        - …
        - Examples provides: resource allocation, traffic forecasting, intent interpretation
    - Goals of AI in NM
        - How should this section should be articulated with the previous one?
        - How to organize this section? Classification of objectives per layer ? (but need also to have transversal objectives). Use the NSM taxonomy (from COMSOC/CNOM, IFIP)? Try to identify important list of attributes that characterize of goal ?
        - Other ideas ?

Status 2/2

- Challenge description (AI, Data, NM actions, acceptability)

  - Lightweight AI : Embed AI algorithms

  - Problem type and mapping: "define the right algorithm for a certain problem" too strict. Need first to **define parameters** that impact the selection of an algorithm to formulate correctly a problem incl. constraints + method to find a good tradeoff

  - Data accessibility: sharing, security and privacy issues

  - Automated network data labelling: for supervised learning, fill the gap between collecting data and feeding the ML algorithms, mapping of labels and objectives is not 1:1

  - Acceptability of AI for NM: interfaces/protocols, scalablity, security/safety, explainability and "educational" issue to allow an AI operating a network

  - Online monitoring and control of the quality and properties of estimators: when the learned model are not accurate anymore?

  - IBN-1: interpreting high-level or natural language intents (NLP/NER) and generation of intents (may intent can be generated from current operations? Can it help for diagnosis?), in relation with human in/on the loop challenge

  - IBN-2: planning of actions to produce the desired outcome

  - AI for Exploiting External Events

  - Commercialization of AI-based products and algorithms: how to transfer or generalize knowledge extracted/created from lab to an operational environment

  - Explainability of Network-AI products

Next steps

- Format the document as an individual ID
- Dedicated meetings and editing sessions to be organized
- First consolidated version at IETF 109 (without use cases)