Intent-driven networks
Some challenges and research directions

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NMRG Virtual Meeting May 2019
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Feature #401…?

YOUR USER REQUIREMENTS INCLUDE FOUR HUNDRED FEATURES.

DO YOU REALIZE THAT NO HUMAN WOULD BE ABLE TO USE A PRODUCT WITH THAT LEVEL OF COMPLEXITY?

GOOD POINT. I’D BETTER ADD “EASY TO USE” TO THE LIST.
Overview

Intent generation and validation

- User input and data
- Operator input and data

- Shared goals
- Pattern

Formulate and solve problem

- Operational constraints
- Execution constraints

Program generation, specification and verification

- Decisions

Instructions

Control points and run-time assessment mechanisms
Challenge 1

Intent generation and validation

Ability to learn and reason on intent sets
(some) Research directions

Natural Language Processing (NLP)
Ontologies and semantic analysis
Lazy learning
Knowledge representation and building:
• Languages, templates, models…
• graph databases, data dependencies…
Challenge 2

Formulate and solve problem

Shared goals
Patterns

Operational constraints

Decisions

Ability to optimize and re-optimize decisions
(some) Research directions

Automatization of the generation of resolution methods (by decomposition)
Learning on choice of resolution method based on theoretical gain
Challenge 3

Ability to generate and verify programs
(some) Research directions

Automatic program generation

Program distribution towards agents and collective decision process on resolution approach considering local/global variables and constraints
Challenge 4

User input and data
Operator input and data

Sensori input
Intent generation and validation

Shared goals Pattern
Formulate and solve problem

Operational constraints
Decisions

Execution constraints
Program generation, specification and verification

Instructions
Instructions

Control points and run-time assessment mechanisms
(some) Research directions

Quality of Intent (QoI) evaluation framework
Self-evaluation, self-testing mechanisms
Increased role for telemetry and analytics
and many other interesting things

Intent checking, normalization
Intent recommendation, learning, optimization
Intent extraction out of CLIs...