INTEND

Intent-based data operation in the cognitive continuum

Hui Song, https://intendproject.eu

Project introduction

- Build GenAI agents with **human-like intelligence** to manage data pipelines in the cloud-edge computing continuum, based on the stakeholder's intents

Adapt like human:
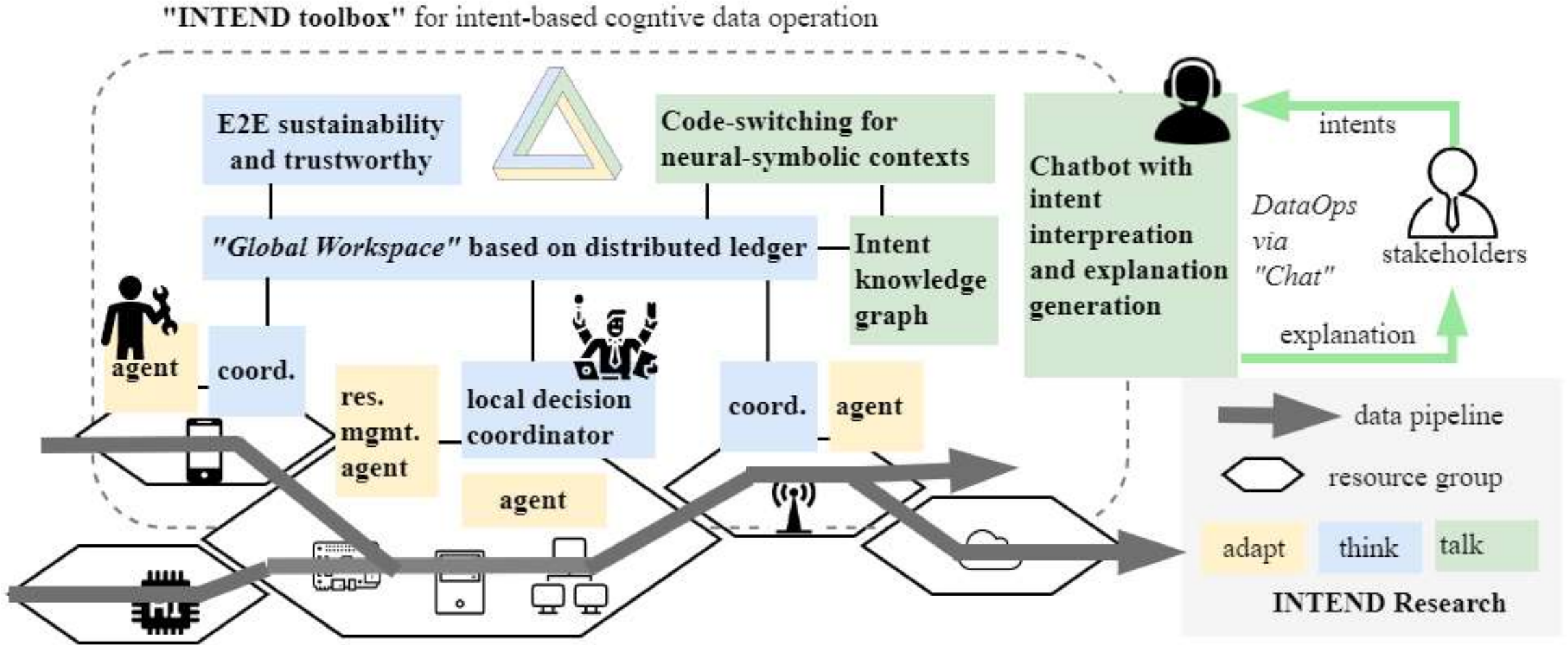continuously **learn** how to handle new situations and new types of resources

Think like human:
make **strategic** decisions for the global continuum, with **decentralized** inputs
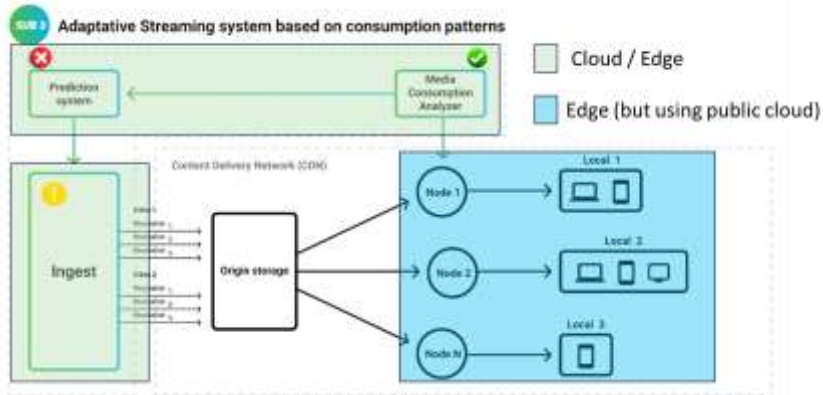
Talk like human:
understand the **intents** of stakeholders and **explain** its own decisions, in a natural way
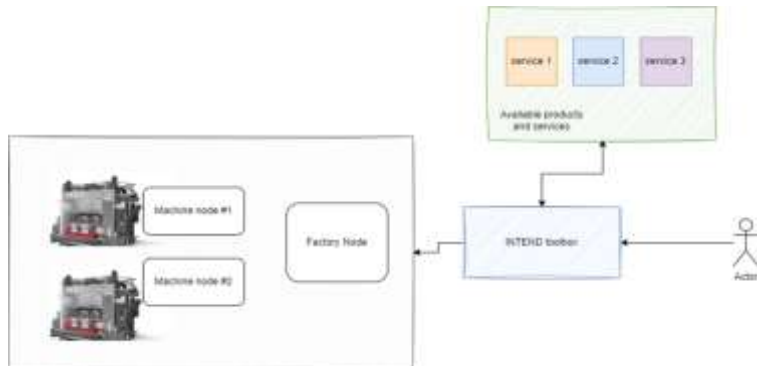
A conceptual architecture

"INTEND toolbox" for intent-based cogntive data operation

Use Cases

Green Media streaming: Enable **proactive approach for VoD content scheduling and runtime management** in the continuum to minimize operational costs and increase environmental sustainability.

MachineTalks – Chat-based operation of machine data analytics platform: Ease machine data analytics service deployment and operation through automated translation of service components and mapping to continuum resources

Use Cases
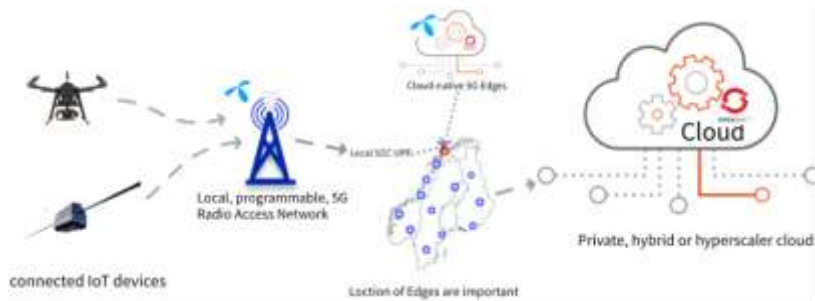
Customer-oriented 5G data-infrastructure: Achieve **flexible and adaptive deployment of customer workloads** and data pipelines to 5G and edge datacentre **infrastructures provided by a mobile network operator (MNO).**

Urban Data Space: Dynamic **adaptation and optimization of analytical processing,** minimizing the traffic of data by allowing for storage (at the edge) for aggregated **air quality/traffic data**.

Impact

- 11 open-source tools
- Open platform for new hardware and AI models
- Coverage of the complete supply chain
- 5 use cases from 5 vertical sectors
- Active community
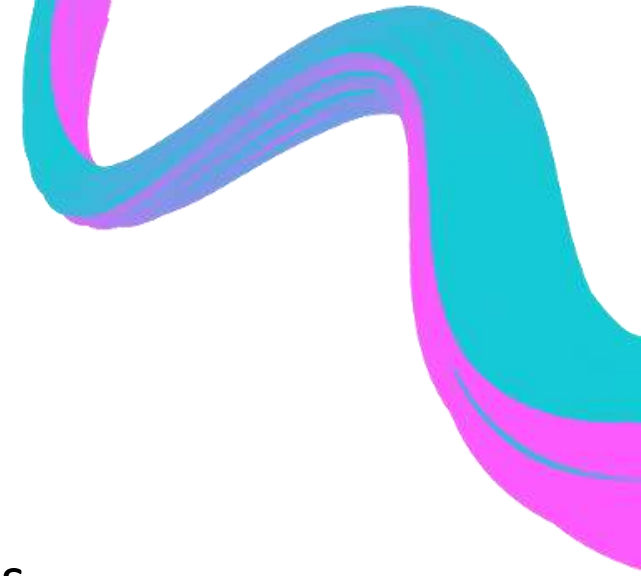- 38+ scientific publications
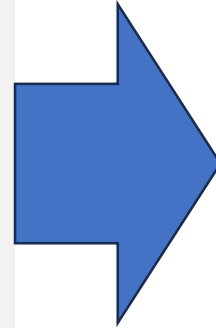
- Novel way of data operation
- Increased data efficiency
- Exploitation of edge resources and unconventional devices
- Reduced environmental footprint of data processing
- Human-oriented digital services
- Contribution to EU's strategic autonomy in data and AI

Project goals for the next semester

- Proof of concept for the key project techniques
  - LLM-powered multi-agents to make data operation decisions
  - Decentralized intelligence to coordinate agent-based decisions
  - Intent-based networking, orchestration and storage management
- Integration of tools
- Definition of minimal valuable scenarios from all use cases

Thanks!