

Motivations

Artificial Intelligence systems are getting more powerful!

- LLMs (ChatGPT, Gemini, Claude, LLaMA, etc.)
- Image Generators (Stable Diffusion, DALL-E, etc.)
- Voice Synthesis (VALL-E, Voicebox, VoiceCraft, etc.)

As AI systems get more capable, all eyes turn toward “Artificial General Intelligence”:

- Have we successfully created an AI system capable of human-level intelligence?
- How can we know for sure if we have?

Unfortunately, most answers to these questions are vague and confusing

- Focuses on emergent capabilities, which are difficult to reliably evaluate

Dimensions of System Intelligence

INT Intelligence

The system has a mechanism that learns a mapping between input data and expected output

TDEP Time-Dependence

The system has a mechanism that considers the temporal dependencies between inputs

ATTN Attention

The system has a mechanism that identifies the relative importance of input dependencies, weighting the decision-making process accordingly

GEN Generality

The system's training objective can be applied to more than one downstream task without any additional training or modification

MULT Multimodality

The system can take in more than one form of data as input

RLTM Real-Time Inference

The system has a mechanism that allows it to process an unbounded amount of continuous input data

ONLN Online Learning

The system's operation does not differentiate between distinct training and inference phases

MEM Memory

The system has a mechanism that can store and recall encodings of previous events and information

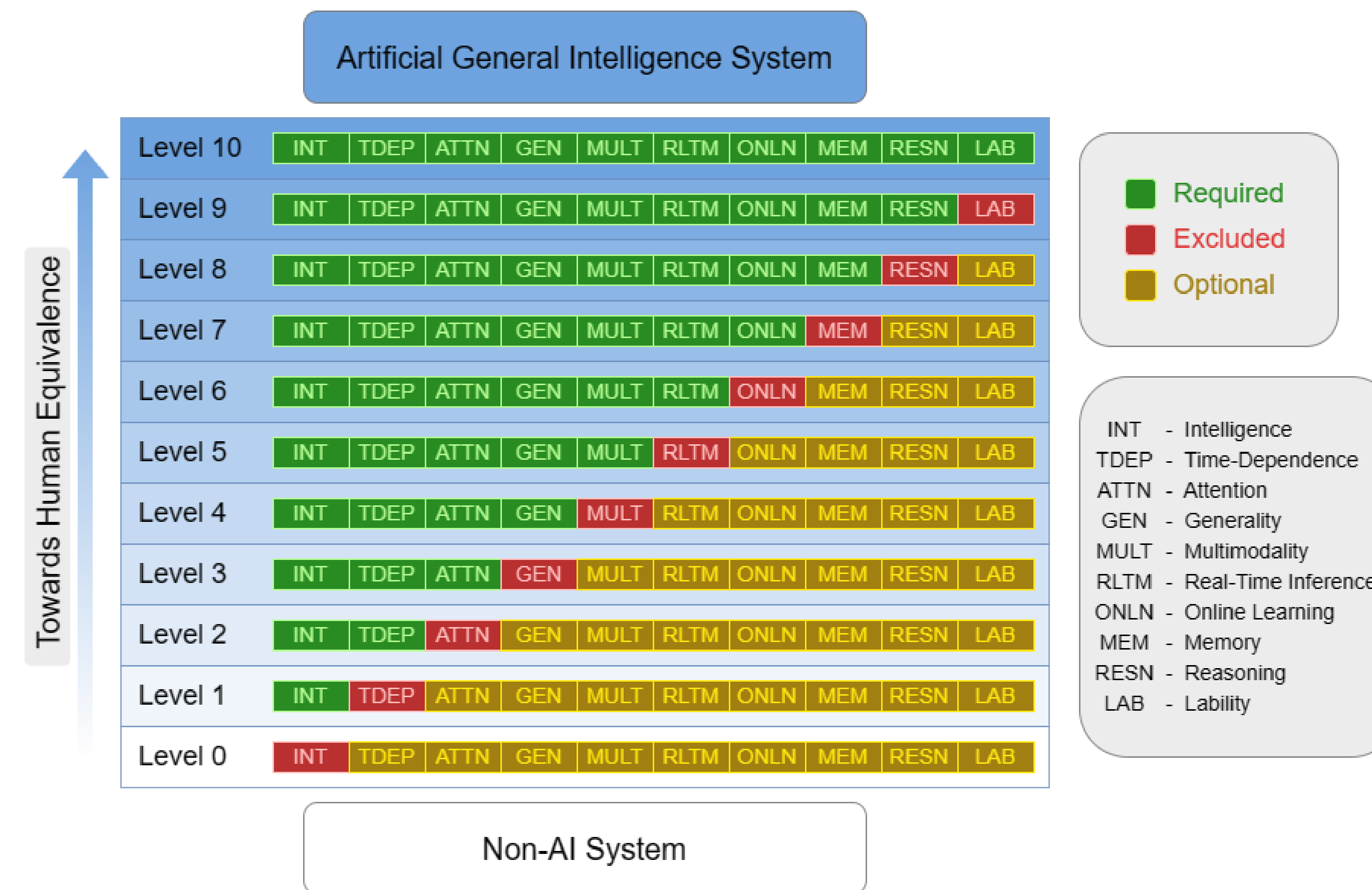
RESN Reasoning

The system has a mechanism that subdivides a complex problem space into fundamental, homogenous, and recognizable components

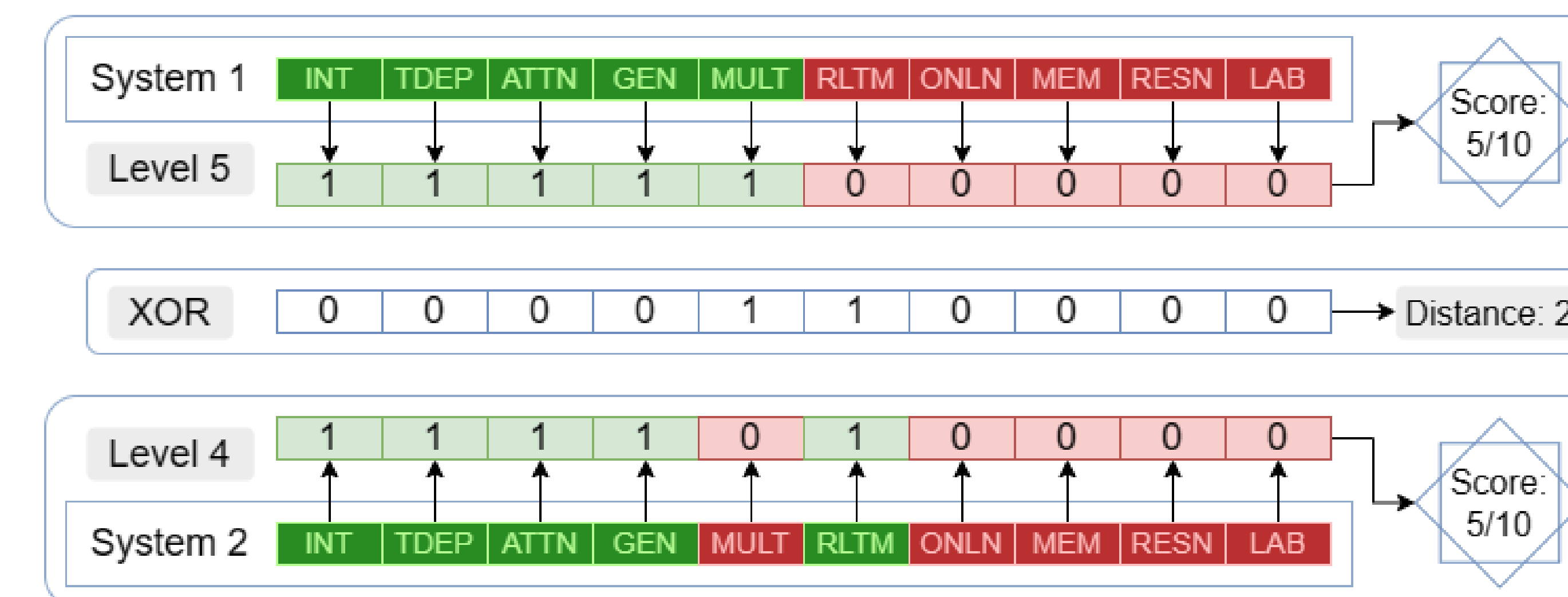
LAB Lability

The system has a mechanism that independently sets and updates its own set of internal goals, irrespective of the training objective

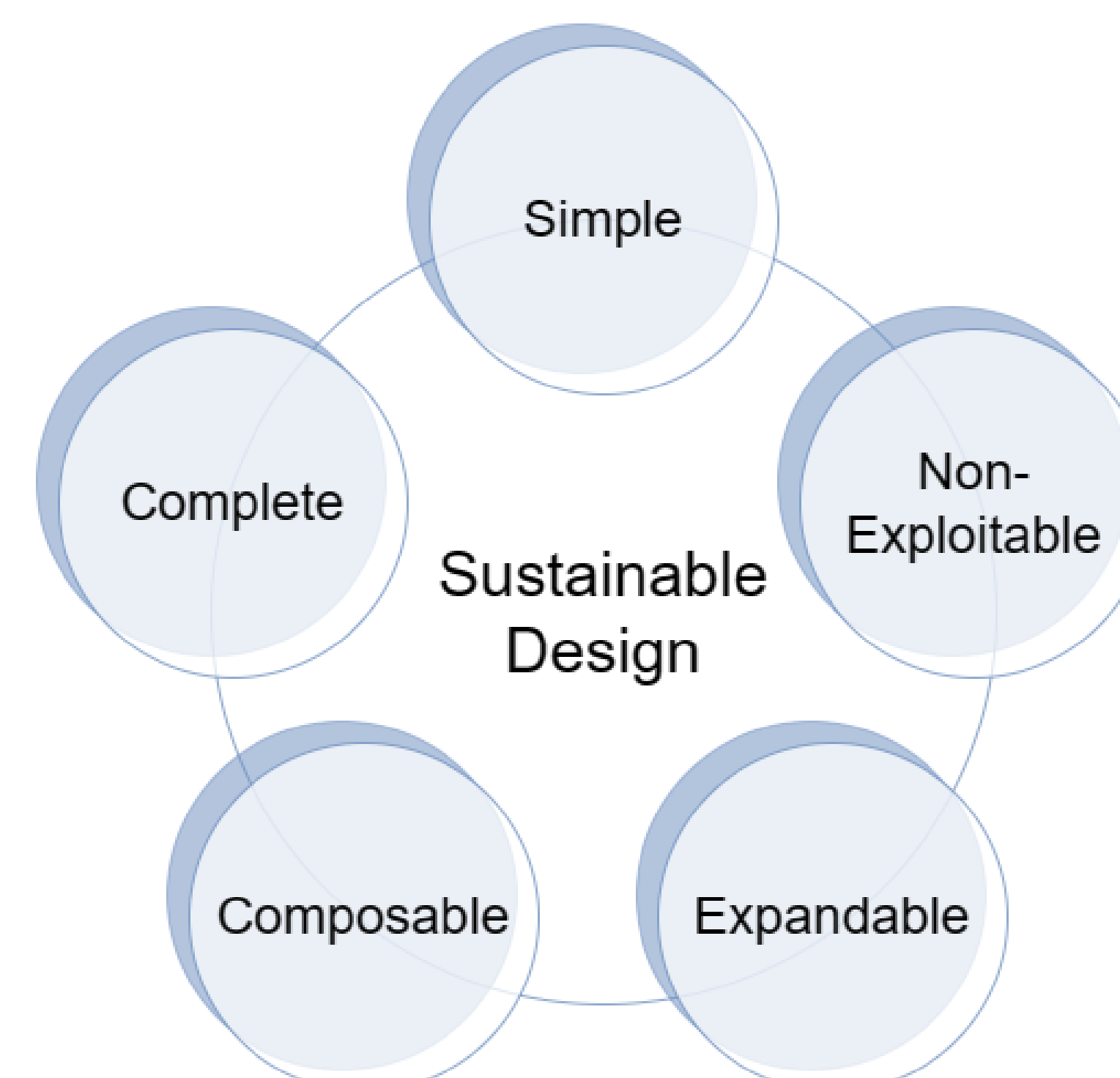
Ranking of AI Systems



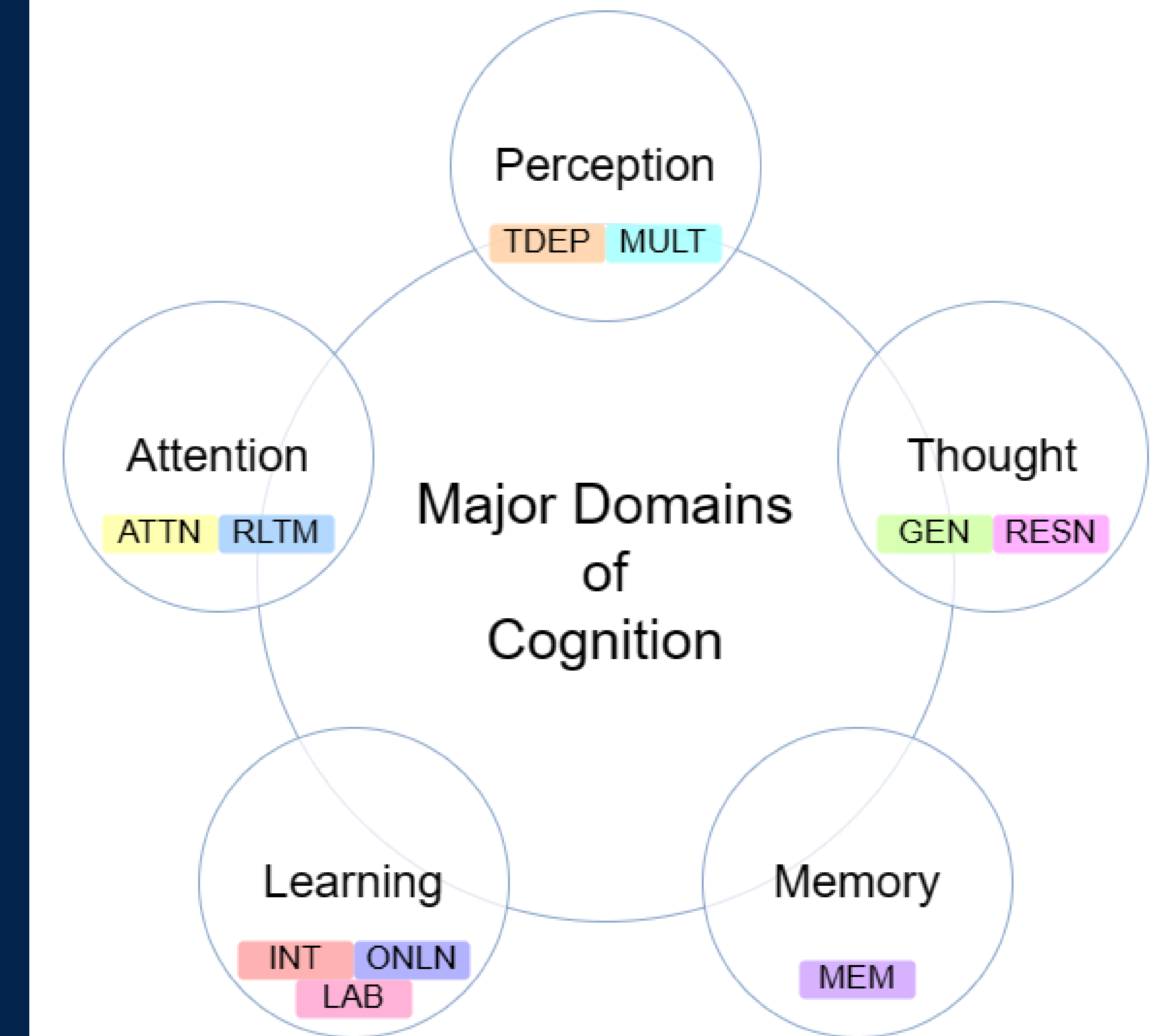
Score of AI Systems



System Considerations



Dimensions: Cognitive Basis



Discussion & Broader Impacts

