Towards a science of curiosity

Initiative: Künstliche Intelligenz – Ihre Auswirkungen auf die Gesellschaft von morgen

Ausschreibung: Künstliche Intelligenz – Ihre Auswirkungen auf die Gesellschaft von morgen - Full Grant (nur nach Aufforderung)

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The main goal of the project is to build a theory of child-like curiosity. Children are arguably the only known system that demonstrably and reproducibly develops into intelligent agents through playful exploration. The project team aims to build machines that do the same. This involves studying how children explore their environment during free play, extracting the algorithms they apply, and using these models to build robots that effectively explore similar environments. Computationally mirroring this development requires a formal understanding of curiosity - the ability to explore environments in the absence of rewards. Studying curiosity demands an inter-disciplinary approach, where developmental psychologists, cognitive scientists, and roboticists work together to understand the human ability to be curious and build algorithms that mirror this ability. The proposed project will coalesce around three objectives. In the first objective, curiosity will be studied by letting children play freely while tracking their actions. In the second objective, the best model to describe children's behavior will be identified, by building cognitive algorithms of child-like curiosity. Finally, in the third objective, robots that can efficiently solve similar tasks will be build. The ultimate goal is to build more powerful robots that play like children, thereby moving towards a science of curiosity.

Projektbeteiligte

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Curious Exploration via Structured World Models Yields Zero-Shot Object Manipulation
Modeling Human Exploration Through Resource-Rational Reinforcement Learning