

# PUBLIC SUBMISSION

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## General Comment

One area that is super important for AI but unlikely to be funded by industry is development-inspired AI, or AI inspired by children's behavior.

Currently successful AI models benefit from enormous amount of training data. Most of them are far beyond the amount of information any human may consume in the entire life time, such as the amount of the corpus needed to train a large language model. Children, on the other hand, can learn to form a model of the world with much smaller amount of data within the first few years of their life. Understanding the learning mechanism will likely lead to more efficient AI algorithms.

Another important feature of childhood learning is the difference in data. They receive multi-modal input while having access to their own motor plan. This embodied nature of data is especially important for learning to understand the world while being able to interact it. To make a comparison, the multi-modal data used by some of the successful AI models are images/videos and paired text description, or sound with paired transcriptions. For visual data, it is very rare that the motion information of the camera is utilized or even available, making it very challenging to learn an embodied representation.

A third difference is the active exploration exhibited in infants and animals, which is a key ingredient for learning efficiently. During such exploration, an agent decides by itself what is the most important information to gather. We don't yet have a computational model that can predict infants' decision making of eye gaze and body motion on a moment by moment basis. If this mechanism is understood, equipping an autonomous learning robot with it will enable much more efficient learning, as nature has proved its success on infants.

Overall, there is a big gap in our understanding of the learning mechanism of infants and toddlers. Understanding this will not only inform the development of AI that learns more efficiently, but also inform how developmental disorders arise. Such knowledge will help developing improved strategy to treat and support children with developmental disorders, such as autism spectrum disorder, and many rare diseases.