**What actually was done?**

We all know that digit assistants don’t understand human. To do so they need an awareness of our beliefs and desires. For example knowing not to offer things at the wrong times or talk about the obvious in case of Chatbots and Siri. Therefore, Neil Rabinowitz created ToM which is a theory of mind that was created in the purpose of observing other expert systems to see how they behave by studying  simple characters moving around a virtual room collecting colored boxes for points.

**What was the experiment (with numbers and results)?**

The experiment consist of three different agents:

One couldn’t see the surrounding room, one couldn’t remember its recent steps, and one could both see and remember. The blind characters tended to follow along walls, the amnesiacs moved to whatever object was closest, and the third species formed subgoals, strategically grabbing objects in a specific order to earn more points.

The first network learns the tendencies of other AIs based on their past actions. The second forms an understanding of their current “beliefs.” And the third takes the output from the other two networks and, depending on the situation, predicts the AI’s next moves.

As a result, The ToMnet learned a strong prior model for agents’ future behaviour, and, used only a small number of behavioural observations, can bootstrap to richer predictions about agents’ characteristics and mental states. It was applied to agents behaving in simple gridworld environments, showing that it learns to model random, algorithmic, and deep RL agents from varied populations, and that it passes classic ToM tasks such as the "Sally-Anne" test of recognising that others can hold false beliefs about the world.

**What ideas from ToM were used?**

ToM has 3 neural networks that compute elements and connections.

The ideas of these networks are to study the “minds” of other computers and predict their actions, and in fact ToMnet could understand when a character held a false belief and can also predict other expert system’s behavior [based on what they know about themselves](http://proceedings.mlr.press/v80/raileanu18a.html).

**What is the solution architecture?**

The solution is ToM which infers beliefs more efficiently than his team’s system, which is based on a more abstract form of probabilistic reasoning rather than neural networks.