Some limitations of the "visit the lab" task

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1 Social Task

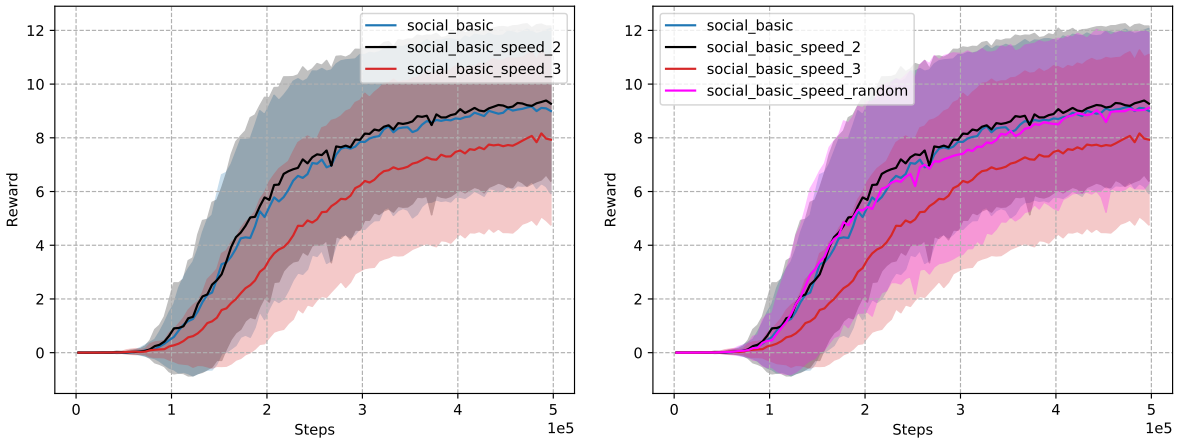

Figure 1: **Comparison of performance depending on the speed for the same (simple) human in the social task.**

In the social task of Figure 1, we see that getting a reward with a speed of 3 is slightly harder than with a lower speed (even random). One hypothesis is that the human bumps into the robot and loses its attention when the human moves too fast. Having a 1-2-1 range of interaction could be one of the reasons why the robot loses the human attention more frequently: with a speed of 3 the robot could lose the human attention all of a sudden, going from a "safe" interaction level to no interaction level. To solve this problem, we could change the interaction zones.

2 Adaptability to different human behaviors

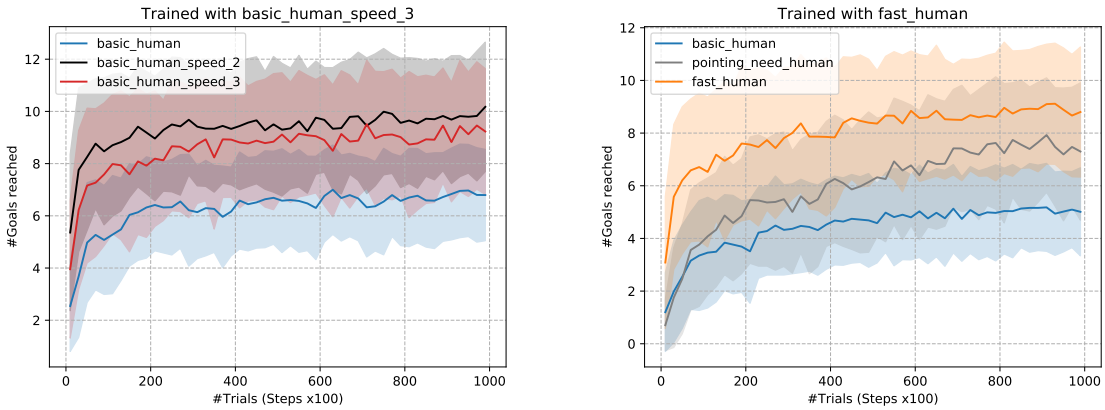

Figure 2: **Performance of the robot in the "visit the lab" when trained on a 'fast' human.** (Left) The robot is trained on the social task with Human 2, who moves at speed two or three with the same 50% probability. (Right) The robot is trained with a basic Human (Human 1) but with a speed of three.

When the robot faced a fast human in the learning process, we can see that it adapts rather well to slow speeds. In Figure 2-Right, we see that when trained on a human with speed 3, the robot has a better performance on the "visit the lab" with a human of speed 2. This could come from the fact that the task is hard to achieve with a human which goes too fast.

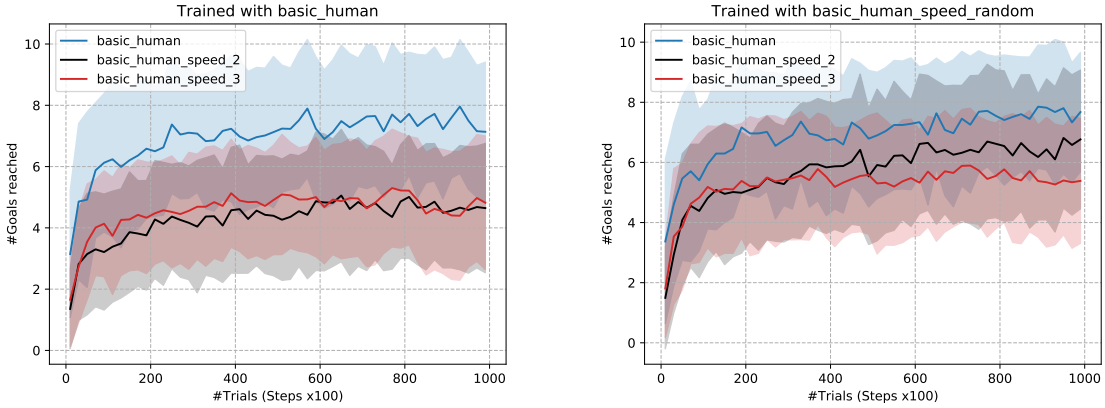

Figure 3: **Performance of the robot in the "visit the lab" task when trained on a 'slow' human.** (Left) The robot is trained in the social task with Human 1 who moves at a speed of 1 and tested on the same human but with a speed of 1, 2 or 3. (Right) The robot is trained in the social task with Human 1 who moves at a uniform and random speed and tested on a speed of 1, 2 or 3.

In Figure 3, we see that the robot fails to adapt well to fast speeds when trained on rather slow speeds. Further reasearch should focus on why this happens.