Curriculum Learning

Teacher-Guided Curriculum[1]

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[1] Based on a blog by Lilian Weng

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- Idea: Expert teacher can use its own knowledge to create a curriculum
- Question: who or what is an expert teacher?

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- Possible answers: "Common sense" methods, real-life expert decisions, a learner learning how to construct a curriculum, ?

The Teacher-Student Setup [Matiisen et al., 2017]

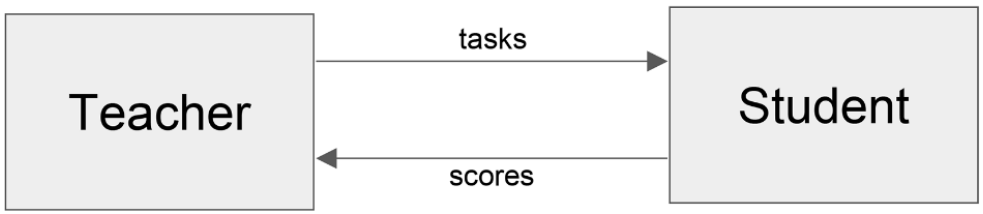


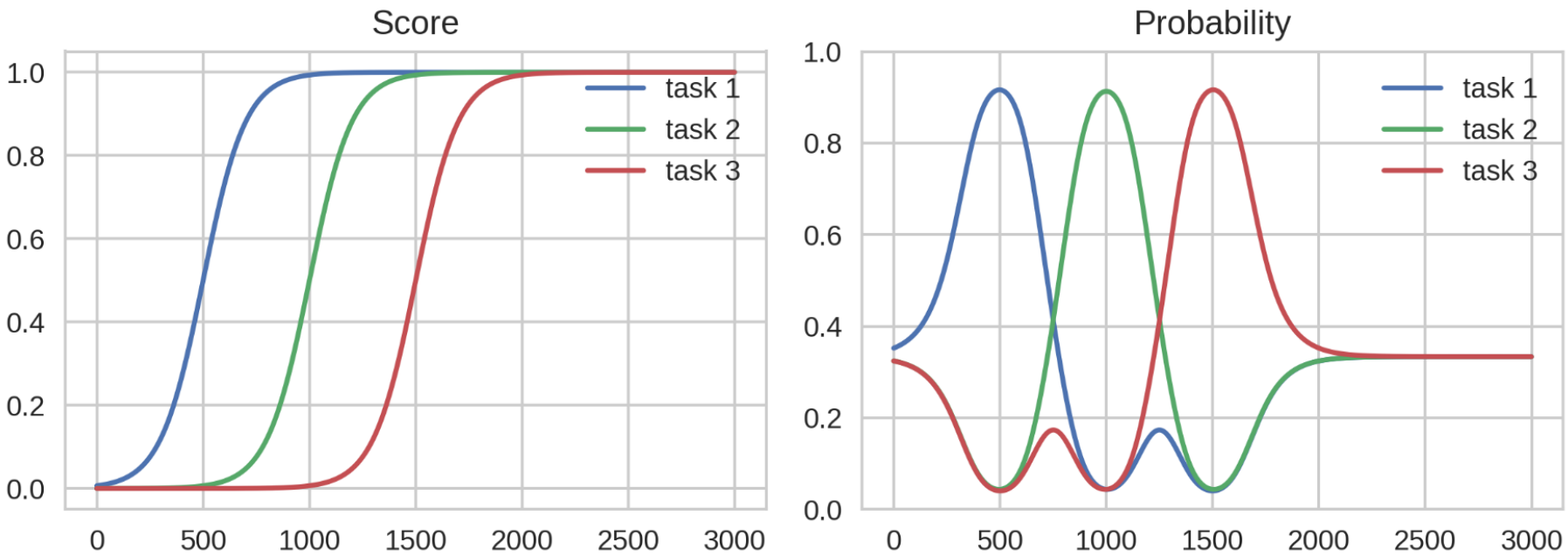
Figure: Teacher-Student interaction

The Teacher

- The teacher observes the student's reward x_t
- The action space consists of all instances i
- The teacher's reward is the change in the agent's reward:

$$r_t = x_t - x_{t-1}$$

The Ideal Result [Matiisen et al., 2017]



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Variations on the idea

- The same method can be applied to continuously parameterized environments [Portelas et al., 2019]
- The teacher can be a fail-safe in safety-critical applications [Turchetta et al., 2020]
- Guided Policy Search [Levine & Koltun, 2013] uses an expert policy to sample trajectories (not necessarily across instances)