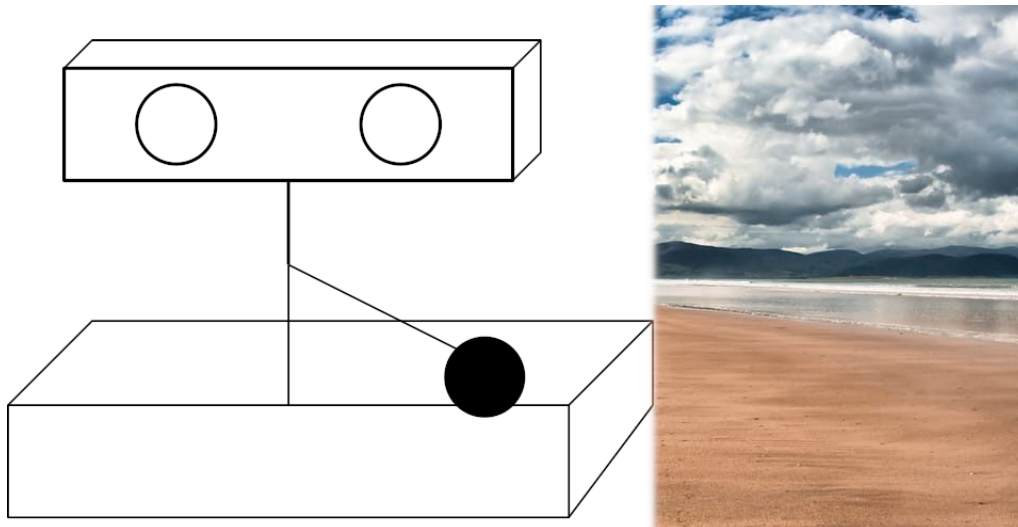


HELP: We need to find pendul-e

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1 The problem

Our little robot, pendul-e has run out of batteries during his mission. We need some help to find him. This is a sketch of him, and a picture he sent us in the last known location (consistent with his past behavior: he likes to go to the beach!)

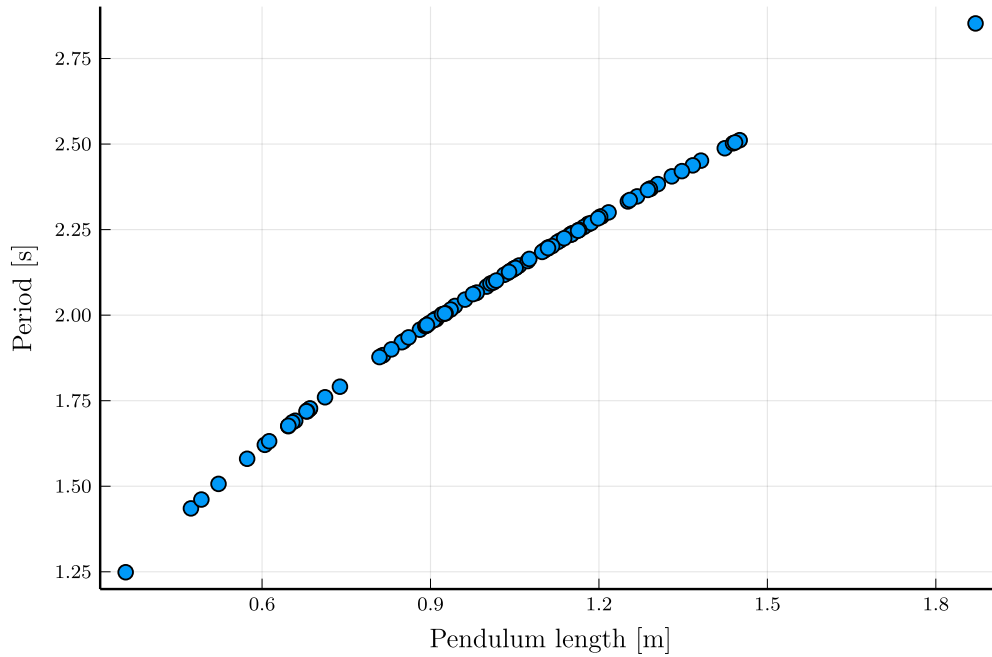


Apart from this picture, he was able to give us the following information:

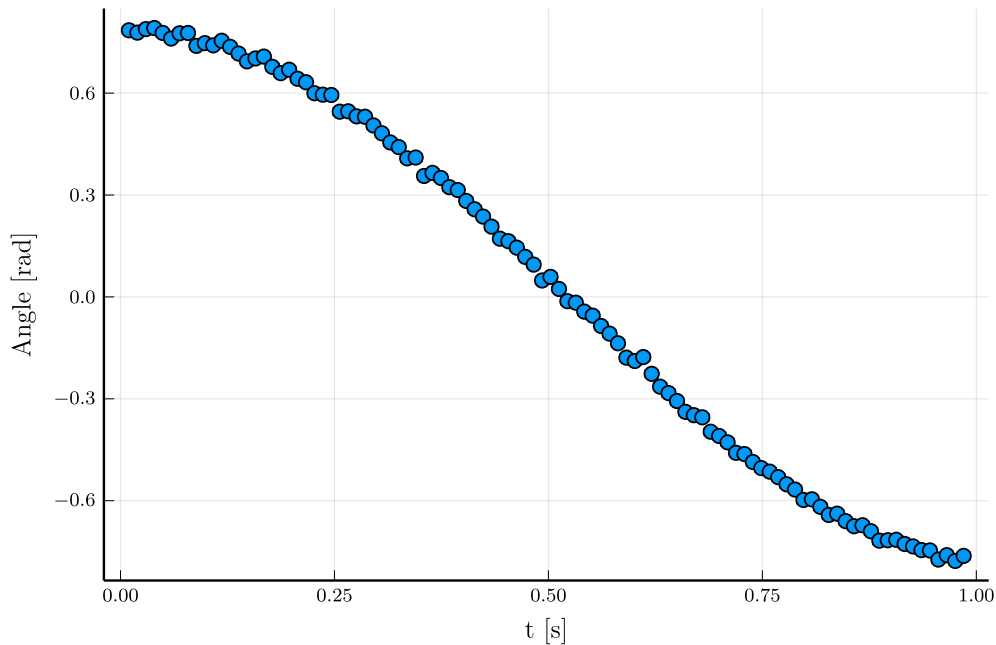
- He is in a place with longitude between -13 and -10 degrees.

Pendul-e is able to make experiments with his pendulum, that consists of nearly massless rod and a bob of unknown mass. He can even change the length of the rod, although is a bit limited, and always has to release the pendulum (with zero initial velocity) from the same starting angle. But he is also very smart: he can even subtract the effect of friction from the data he sends!

- He has given us very precise data of the period of his pendulum for different lengths of the rod



- He has given us very precise data, of the trajectory of his pendulum for the case of the length of the rod $l = 1$ m.



We need some mundane data urgently:

- For the case of a length of the rod $l = 1$ m, what would be the position of the pendulum at $t = 1$ s?
- What would be the measurement returned by pendul-e for the position of the pendulum at $t = 1$ s?

But more important than anything, we need you to help us locate pendul-e... Can you tell us where to look for him?