trolley

**Load + Ping sensor**

Even at the presence of revolute joint between string and load, due to the centripetal force induced by trolley’s acceleration, the load will stay aligned with string’s direction provided no external forces relative to the two.

Because is one-to-one function to,

In which denotes string + load length and denotes distance from Ping sensor. Ping sensor chosen must have the angular range of boundary of (probably).