



About the stability of a 360-tonne inverted pendulum

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Large granite boulders, also known as rocking stones, are unique tourist attractions. Nonetheless, they pose a significant safety risk. This risk primarily depends on the exact geometry of the contact surface. Due to the geometrical uncertainty, the safety of the rocking stone cannot be assessed by the standardized partial safety factors widely applied for civil engineering structures. In a consortium with local colleagues we investigated the stability of the *Pena do Equilibrio*, a rocking stone weighing 360 tonnes in Spain. In this presentation, I will present the reconstruction of the rock shape and contact surface, and a novel method introduced to quantify its safety. We point out that the classical failure modes considering solely planar motions are incomplete. Specifically, we identified a trajectory of motion along which six strong men may be able to topple the stone. The study has been awarded the Giovanni Barla Prize by the journal *Rock Mechanics and Rock Engineering*.

