1. Background

Passive Dynamic Walker and Limit cycle walker (based on PDW) are designed to utilize their body dynamics effectively. But there is few robot based on PDW that has upper body with joint compliance.

2. Purpose

To realize limit cycle walking utilizing synergy of whole body dynamics

3. Robot: Pneumat-BT

We developed a 3D biped walker with a torso which is supported by flexible McKibben pneumatic muscles.
4. Method

**Limit cycle controller:**
- A certain valve operation pattern within one walking cycle (open loop)
- The control sequence is triggered by touch sensors installed on the feet

We divided the robot’s motion into three 2D planes; sagittal, frontal, and horizontal. We tuned control parameters of **key muscles** that seems to govern the whole body behavior for each plane.

5. Result

We experimentally demonstrate that the humanoid robot walks stably with a simple limit cycle controller.