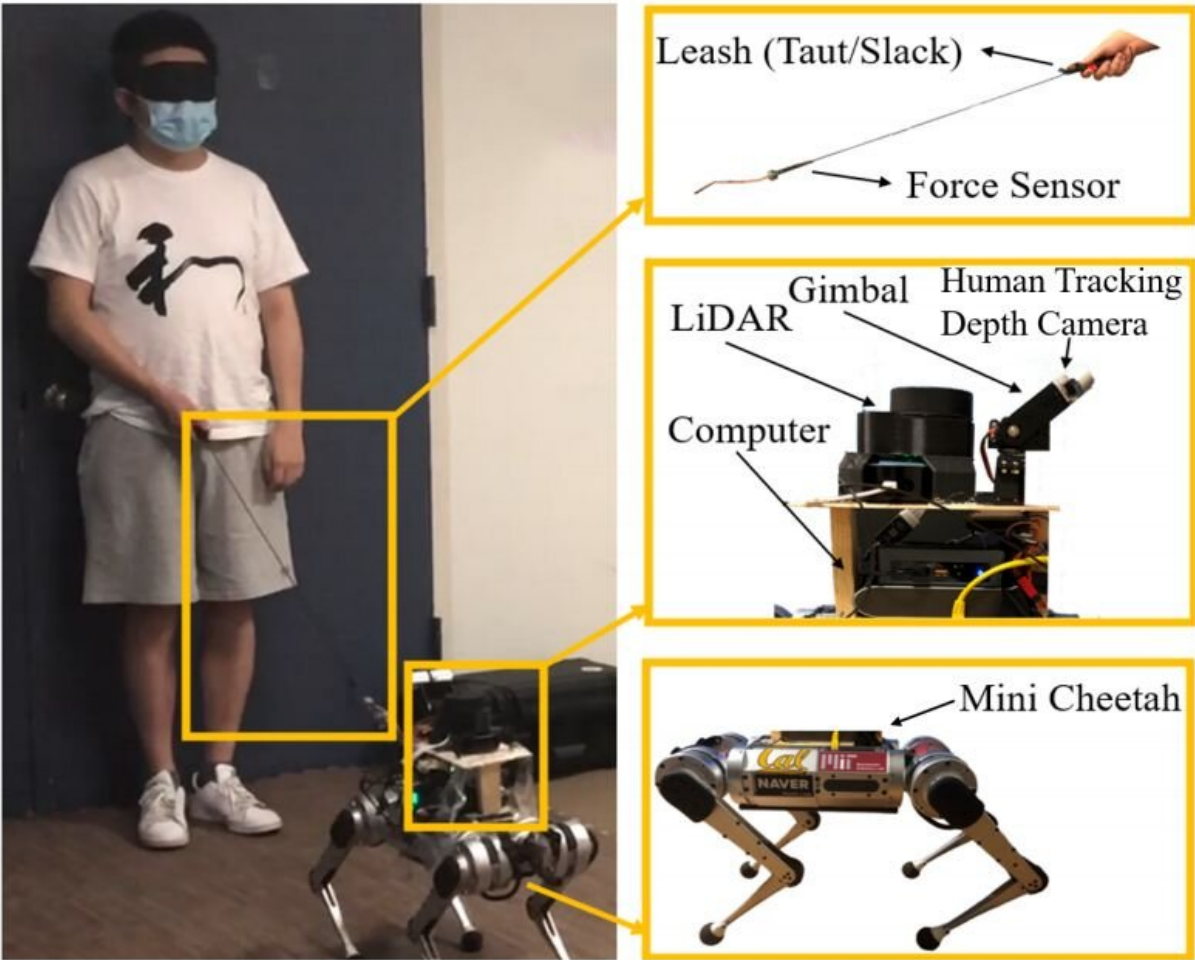


A laser equipped robotic guide dog to lead people who are visually impaired

April 7 2021, by Bob Yirka



The Mini Cheetah is guiding a blindfolded person to avoid obstacles with leash-guided assistance: a leash (top right) is used to connect between the robot and the human, a 2D LiDAR is used for robot localization and a depth camera is used for human detection (middle right). The leash could be taut or slack during the

navigation. Credit: arXiv:2103.14300 [cs.RO]

A small team of researchers at the University of California, Berkeley has developed a robot dog to help in ways similar to real guide dogs. They have written a paper describing their robot guide dog and have uploaded it to the arXiv preprint server. They have also posted two videos demonstrating the capabilities of their robot on YouTube.

Guide [dogs](#) are very useful to people who are blind or have low sight, of that there is no doubt. But they have their limitations. The first is that it takes a lot of time and money to train a dog, leaving many people on long waiting lists or unable to afford them at all. Another drawback with guide dogs is their inability to read a map and then use it to navigate to a desired location. In this new effort, the researchers have developed a [robot](#) dog that is able to carry out the duties of a live guide dog as well as provide additional services.

The researchers started with a robot made by Boston Dynamics called mini cheetah. It is able to walk on four legs and comes equipped with lasers and cameras that allow it to map out nearby terrain. It also comes with a computer brain to use what it sees to walk around while avoiding collisions with objects and to walk a predetermined course. The researchers added a leash to the robot and a human tracking depth camera. The depth camera is needed to provide location information to the robot dog concerning the human that it is leading. The robot and the person work together to move from one location to the next. First, a map describing the path that the dog is to take is downloaded to the robot dog. The map also includes terrain details to help the pair get where they want to go. Then, finally, the human grabs hold of the leash and the pair begin walking.

Testing has shown that the robot dog is able to lead a person (a blindfolded person with sight) from a starting point to an ending point and that it can be done with both a taut and slack leash. More work will need to be done, however, before the robot dog is ready to lead a person who is blind in a real-world setting. The robot will need to be given a smoother and quieter gait, for example, and it will need to give the person it is leading more feedback as the walk unfolds.

More information: Robotic Guide Dog: Leading a Human with Leash-Guided Hybrid Physical Interaction, arXiv:2103.14300 [cs.RO]
arxiv.org/abs/2103.14300

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