

# Data-gathering Tumbleweed robot seeks to understand desertification

6 February 2014, by Nancy Owano



(Phys.org) —Jerusalem based industrial designer Shlomi Mir knows a few things about the desert. He also is aware of desertification as a global problem. He has been working on a tool, the Tumbleweed, to help researchers both understand and explore solutions to hold back the spreading desert. Mir's Tumbleweed concept is a robot that can roll across the desert, gathering information. As *Wired* explained, in its current prototype form Tumbleweed gathers that data for transmission. On Mir's website, an illustration shows an Arduino, Android-based core for GPS communication and data collection. The illustration also shows a kinetic generator for power. "Desertification is a serious and irreversible state of land degradation, particularly evident in drylands," said Mir.

However, as he told *Wired*, there is no one-two quick solution for "greening" a desert; data gathering is but one challenge for scientists trying to deal with the complexities. Mir and others are aware of potential remedies. By monitoring land conditions and planting in strategic locations,

drylands in danger of desertification may be stabilized and erosion by wind and rain stopped. However, Mir said, "the areas are far too vast for conventional action. Enter the Tumbleweed."

How does [desertification](#) spread? How do dunes move? Where are the next big problems? Data-gathering could yield some answers for scientists.

Designed as a platform to operate autonomously for years, the Tumbleweed can travel thousands of kilometers using only the power of the wind. Instead of reliance on solar panels or electricity to power motors, the round shape and arrangement of sails allow it to catch the wind and speedily roll in any direction. Mir's site noted that the box kite sail arrangement is considerably efficient in using available winds. A kinetic generator produces enough energy to power the onboard computer, sensors, and motor.

The Tumbleweed waits for favorable wind direction, collecting data. When the [wind](#) changes direction, the Tumbleweed transforms into a ball. The sails propel the ball towards its destination.

This year, according to *Wired*, he will experiment with 20 devices scattered in the field; his vision is one of hundreds of Tumbleweeds mapping out large territories. "For me," said Mir, "design is a bridge between different fields and disciplines, details and context, theory and practice – connecting problems to solutions."

**More information:** [www.shlomi-mir.com/](http://www.shlomi-mir.com/)  
[www.wired.co.uk/magazine/archi...-blowing-in-the-wind](http://www.wired.co.uk/magazine/archi...-blowing-in-the-wind)  
[www.wired.com/design/2014/02/r...-vent-spread-deserts/](http://www.wired.com/design/2014/02/r...-vent-spread-deserts/)

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