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## POPULAR MECHANICS BREAKTHROUGH AWARDS

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## 10 Innovators Who Changed the World in 2013

These brilliant engineers, designers, and dreamers captured our imagination by creating swarms of smart rescue robots, cars that drive themselves, and a rugged rover that could change the way we think about exploring the Red Planet. They are PopMech's 2013 Breakthrough Award winners. (See also the [10 Breakthrough Products of 2013](#).)

BY LOGAN WARD



1



15

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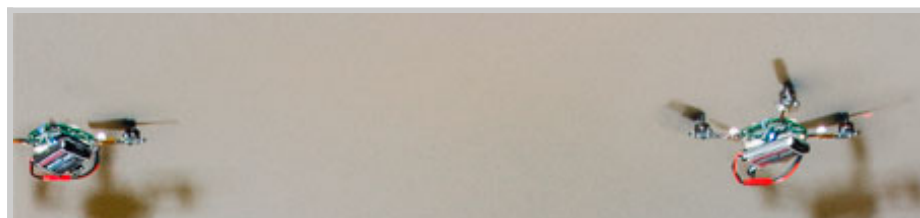
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Nathaniel Wood

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## Tiny Drone Squadron

**Swarm Micro-UAVs: Vijay Kumar, Shaojie Shen, Matthew Turpin (University of Pennsylvania); Nathan Michael (Carnegie Mellon University); Daniel Mellinger and Alex Kushleyev (KMel Robotics)**

In the future the first responders for many disasters could include flying robots, sent in to map dangerously compromised buildings. A team of engineers, led by the University of Pennsylvania's Vijay Kumar, is developing autonomously flying nano quadrotors that can fly in squadrons and pull off incredible tasks. They can spontaneously create maps or assemble a miniature truss structure out of a kit of parts. Each quadrotor has an onboard mobile processor and sensors for gauging how to



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move through the air while also accounting for obstacles and wind, plus a short-range wireless antenna for communicating with other drones. Those capabilities help the drones weave figure-eight patterns in the air and stream through windows without crashing. The long-term applications include construction and environmental monitoring.

But disaster response may come first. Nathan Michael, a former student of Kumar's who is now a professor at Carnegie Mellon, predicts the search-and-rescue community will be using small flying-swarm robots in the next three to five years. "In the long term, [UAVs may change how we think](#) about the whole cycle of disaster," Michael says. "Not just responding to the aftermath but preventing losses beforehand by mapping out challenging environments."

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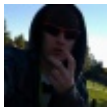


The Monumental New US-to-Canada Bridge

by nRelate

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**Nathan Mcmillen** · Harvard University

WOO VR FTW

Reply · 5 · Like · October 12, 2013 at 7:48am



**Kevin Murphy** · Top Commenter · Los Angeles, California

Don't try that "automatic following distance" gizmo in L.A. traffic. You leave that much space in front of you and 7 cars know s w hat the GM deice w ill do then.

Reply · 1 · Like · October 13, 2013 at 3:21pm



**Le Tung Son** · Học viện Tài Chính (Academy Of Finance)

No cost-w ater filter is impressive !

Reply · Like · November 5, 2013 at 8:45am



**Phantas Magoria**

PLEASE FOR THE LOVE OF EVERYTHING THAT IS HOLY DO NOT INCLUDE HEADPHONES BUILT INTO THE RIFT. Just l should go buy a better pair. The w orst thing that could happen to the Rift is built-in headphones. The last thing I w ant is sound device built in w hen I have a pair of sennheiser hd650 headphones.

Reply · Like · October 26, 2013 at 2:17pm



**Oskar Nowosiecki** · Hillsborough High School

Hopefully they eventually make the Oculus Rift next gen console compatible in order to make it available to a broader audience

[Reply](#) · [Like](#) · October 22, 2013 at 1:51pm



**Beverly Millson**

SynTouch's BioTac will pave the way for a new generation of industrial, medical, and military robots, too. It allows measurement of contact, magnitude and direction of force, vibration and temperature, so we can only begin to imagine how this sensor is applied.

[Reply](#) · [Like](#) · October 11, 2013 at 7:03am



**Micah Olvera** · Warehouse Manager at The Spaceship Company

A lot of Naval Aviation firsts for this aircraft over this last year!

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**Doug Dietz** · Works at Retired

That's my Northrop!

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**Pat Collins** · Unionville High School

rat

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**Alexandre Louis Kleinubing** · Coordenador at Vigilância Sanitária

i'm live where don't need water treatment because still the water is pure

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**Eoskar Marcelo** · University of Concepción

so?

[Reply](#) · [Like](#) · October 12, 2013 at 11:39am

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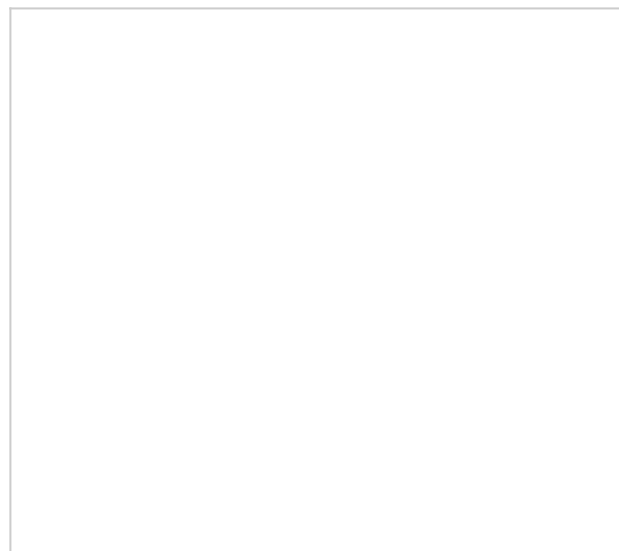
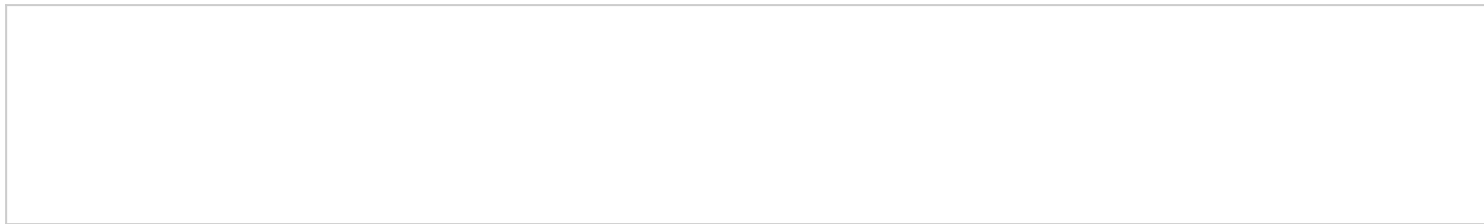


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