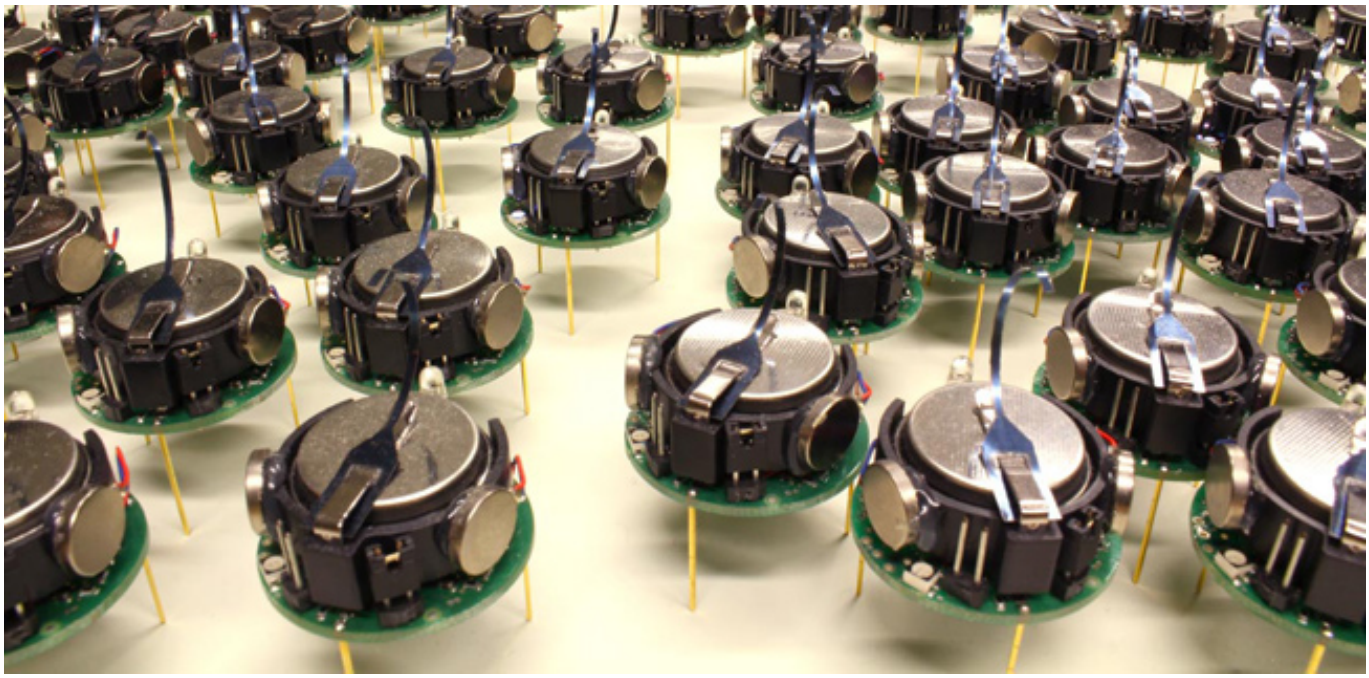
Photos of the Day: A self-organizing thousand-robot swarm

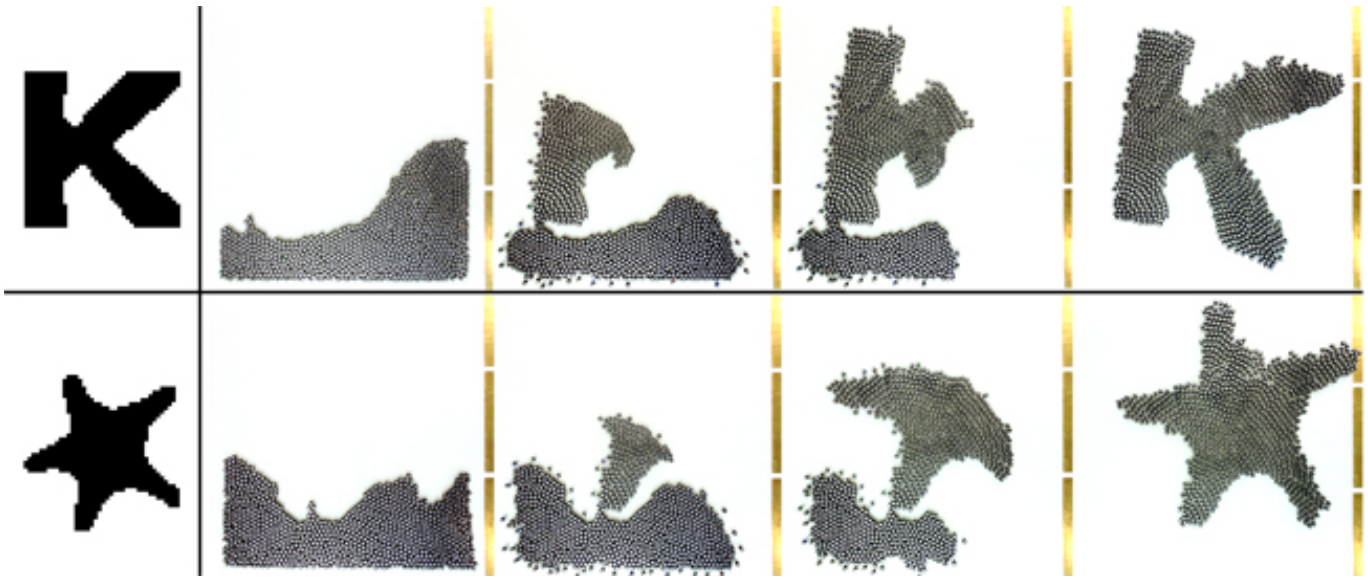
Harvard University



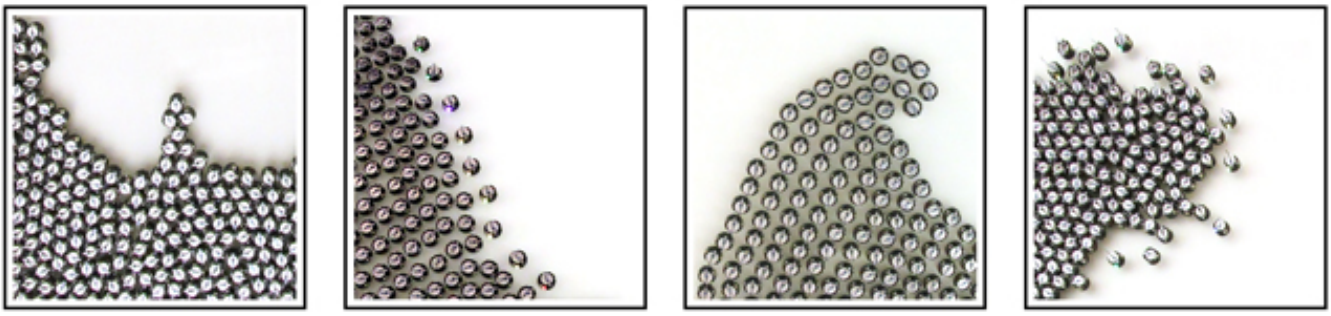
Just as trillions of individual cells can assemble into an intelligent organism, or a thousand starlings can form a great flowing murmuration across the sky, the Kilobots demonstrate how complexity can arise from very simple behaviors performed en masse. (Video below).

Read: Aut **[1]**ono **[1]**mous **[1]**Kilobots **[1]** Arrange **[1]** Themselves into Vast, **[1]** Complex Shapes **[1]**

To computer scientists, they also represent a significant milestone in the development of collective artificial intelligence (AI).



Given a two-dimensional image, the Kilobots follow simple rules to form the same shape. Visually, the effect is similar to a flock of birds wheeling across the sky. “At some level you no longer even see the individuals; you just see the collective as an entity to itself,” says Radhika Nagpal. (Image courtesy of Mike Rubenstein and Science/AAAS.)



In a swarm of a thousand simple robots, errors like traffic jams (second from left) and imprecise positioning (far right) are common, so the algorithm incorporates rules that can help correct for these.

The thousand-Kilobot swarm provides a valuable platform for testing future collective AI algorithms.

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