

Artificial bee eye gives insight into insects' visual world

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Despite their tiny brains, bees have remarkable navigation capabilities based on their vision. Now scientists have recreated a light-weight imaging system mimicking a honeybee's field of view, which could change the way we build mobile robots and small flying vehicles.

New research published today, Friday, 6 August, in IOP Publishing's *Bioinspiration & Biomimetics*, describes how the researchers from the Center of Excellence 'Cognitive Interaction Technology' at Bielefeld University, Germany, have built an artificial bee eye, complete with fully functional camera, to shed light on the insects' complex sensing, processing and navigational skills.

Consisting of a light-weight mirror-lens combination attached to a USB video camera, the artificial eye manages to achieve a field of vision

comparable to that of a bee. In combining a curved reflective surface that is built into acrylic glass with lenses covering the frontal field, the bee eye camera has allowed the researchers to take unique images showing the world from an insect's viewpoint.

In the future, the researchers hope to include UV to fully reflect a bee's colour vision, which is important to honeybees for flower recognition and discrimination and also polarisation vision, which [bees](#) use for orientation. They also hope to incorporate models of the subsequent neural processing stages.

As the researchers write, "Despite the discussed limitations of our model of the spatial resolution of the honeybees compound eyes, we are confident that it is useful for many purposes, e.g. for the simulation of bee-like agents in virtual environments and, in combination with presented [imaging system](#), for testing bee-inspired visual navigation strategies on mobile robots."

More information: "Mimicking Honeybee Eyes with a 280 FOV Catadioptric Imaging System" (W Sturzl et al 2010 Bioinspir. Biomim. 5 036002) stacks.iop.org/1748-3190/5/036002

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