The digital embryo camouflage challenge dataset

Download data (camouflage-embryos-data.zip)

This dataset provides 20 images of 9 objects. Each image has a novel camouflage albedo texture map, and a novel background of other digital embryos, also with a novel arrangements and camouflage patterns. The target object is always in front, i.e. unoccluded and "in plain view". The test set consists of 20 additional camouflaged images of the 9 objects. It is difficult to perceive the target object in any given image without experience.

Video

As an illustration of the effectiveness of the camouflage, note that on initial viewing a target object in the video below only becomes visible once it moves. Try pausing, then restarting the video. After a while, you may learn to recognize and segment the target object even in a static view.

Making Digital Embryos

Digital embryos

Digital embryos are are created using a stochastic process which is analogous to embryological development. The novelty of the objects arises from the random initialization of growth "hormones" to the vertices of the polygon "egge". Because of the embryological nature of the algorithm, digital embryos bear some resemble to living forms, although they do not usually look like any particular plant or animal species. Digital embryos may have applications in art, entertainment, research, or anywhere novel 3D shapes are useful. Our interest is in vision research to understand how we learn novel objects. the embryos are used to study camouflage, visual learning, and object recognition. [1]

Brady, M. J., & Kersten, D. (2003). Bootstrapped learning of novel objects. J Vis, 3(6), 413-422.(pdf)

For more information on the algorithm, see Brady, M. J. (1999). *Psychophysical investigations of incomplete forms and forms with background*. Available from Dissertations & Theses @ CIC Institutions; ProQuest Dissertations & Theses A&I. (304522737)

For more on the development and applications of digital embryos, see Jay Hegdé's web page

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1. Mark J Brady and Daniel Kersten. Bootstrapped learning of novel objects. *Journal of Vision*, 36: 2–2, 2003. doi:10.1167/3.6.2.