CLARK UNIVERSITY

CHALLENGE CONVENTION.
CHANGE OUR WORLD.

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Hello !

I am an instructor of undergraduate and graduate courses, specializing in C++/Python/R programming, data mining, systems design overview, and STEM technical communication. My teaching includes GPT technology to iteratively one's writing precision and clarity using entropic scoring algorithms. I employ interactive frameworks, active learning strategies, and collaborative assignments (JAMs) to bolster student self-confidence and career preparedness.

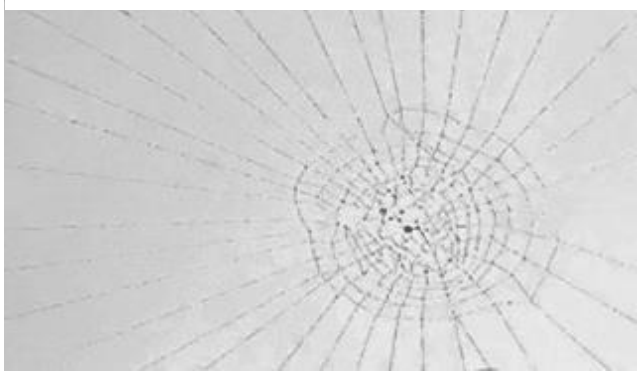
Melittologic and arachnids, mainly honeybee and orb-weaver spiders, inspire my adaptive learning approaches by understanding their visual, cooperation, and structural adaptations. Bee festooning and averting predators with patterns and gimmicks help me conceptualize higher principal thinking students, such as

- A worker bee signals a sentry about a mite facilitating hive health, unity, and peer intelligence.
- A spider's adaptive stabilimentum patterns decoy a predator's perception, even cloaking their abdomen or cephalothorax in plain sight.

Making available learning accessible "anywhere/anytime" facilitates students to understand in REAL_time. I create academic and learning media across domains in google docs, GitHub, and Colab notebooks for interactive learning bent on textual and numerical analysis. I look forward to learning and sharing with you.~ brian

festooning bees mending [1]

stabilimentum <zigzag decoration or warning?>



github.pages

code

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1. Festooning bees from Wildflower Meadows. Retrieved from: www.wildflowermeadows.com

Arachnids => Antipredator strategies and visual asecthics

Robledo-Ospina, Luis, et al. Visual Antipredator Effects of Web Flexing in an Orb Web Spider, with Special Reference to Web Decorations. *Die Naturwissenschaften* 110.3 (2023): 23. *ProQuest*. Web. 18 Aug. 2023.

Abstract Some visual antipredator strategies involve the rapid movement of highly contrasting body patterns to frighten or confuse the predator. Bright body colouration, however, can also be detected by potential predators and used as a cue. Among spiders, Argiope spp. are usually brightly coloured but they are not a common item in the diet of araneophagic wasps. When disturbed, Argiope executes a web-fexing behaviour in which they move rapidly and may be perceived as if they move backwards and towards an observer in front of the web. We studied the mechanisms underlying web-fexing behaviour as a defensive strategy. Using multispectral images and high-speed videos with deep-learning-based tracking techniques, we evaluated body colouration, body pattern, and spider kinematics from the perspective of a potential wasp predator. We show that the spider's abdomen is conspicuous, with a disruptive colouration pattern. We found that the body outline of spiders with web decorations was harder to detect when compared to spiders without decorations. The abdomen was also the body part that moved fastest, and its motion was composed mainly of translational (vertical) vectors in the potential predator's optical fow. In addition, with high contrast colouration, the spider's movement might be perceived as a sudden change in body size (looming efect) as perceived by the predator. These efects alongside the other visual cues may confuse potential wasp predators by breaking the spider body outline and afecting the wasp's fight manoeuvre, thereby deterring the wasp from executing the fnal attack. Keywords Deimatic displays · High-contrast visual cues · Secondary defensive strategies.

Stabilmentum

A **stabilimentum** (plural: **stabilimenta**), also known as a **web decoration**, is a conspicuous silk structure included in the webs of some species of orb-web spider. Its function is a subject of debate.

Baltimoreandohiorr(2019), https://www.youtube.com/watch?v=kNzg0PCVMqk

https://en.wikipedia.org/wiki/Stabilimentum