A Pie in the Face for Global FOE Theories

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Focus of optical flow expansion (FOE) detection remains the most intuitively satisfying paradigm for self motion (egomotion) perception theories. Despite evidence that such perception is dominated by information in the periphery of the optical array sample, theories taking the peripheral approach were rejected in favor of theories taking a global approach, because of findings that samples restricted to very small visual angles are sufficient to determine egomotion perception. But global theories fail the looming test: the projection of a looming object, e.g., a pie aproaching one's face, presents an expanding optical region which dominates one's whole sample and exhibits its own FOE. In practice, one perceives a pie about to collide with one's face. But global theories necessarily must determine that the victim will perceive himself as moving toward the pie! Peripheral theories escape this fundamental flaw, and a theory recognizing that the periphery is adjustable is immune to the evidence against the older theories, which assumed a fixed periphery. The optical array region sampled for conscious attention is known to be variable. If the (annular) region for egomotion detection is peripheral to the central attentional area, then it is adjustable as a side effect of central area variation.