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**Henry Adams\*** ([henry.adams@colostate.edu](mailto:henry.adams@colostate.edu)), Colorado State University, Department of Mathematics, 1874 Campus Delivery, Fort Collins, CO 80523. *Evasion paths in mobile sensor networks.*

Suppose ball-shaped sensors wander in a bounded domain. A sensor doesn't know its location but does know when it overlaps a nearby sensor. We say that an evasion path exists in this sensor network if a moving intruder can avoid detection. Relative homology or zigzag persistence give a necessary condition, depending only on the time-varying connectivity data of the sensors. However, no method with time-varying connectivity data (i.e. Cech complexes) as input can give necessary and sufficient conditions for the existence of an evasion path. Indeed, the existence of an evasion path depends on more than just the fibrewise homotopy type of the region covered by sensors. In the setting of planar sensors that also measure weak rotation information, we provide necessary and sufficient conditions for the existence of an evasion path, and we pose an open question concerning Cech and alpha complexes. Joint with Gunnar Carlsson, with recently computed statistics for the probability of mobile coverage under different motion models joint with Deepjyoti Ghosh, Clark Mask, William Ott, and Kyle Williams at the University of Houston (code at <https://github.com/elykwilliams/EvasionPaths>). (Received September 09, 2020)