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STREAM OF MOVING OBJECTS ALONG A GEODESIC ARC IN $\mathbb{R}^2$, $\mathbb{R}^3$ AND AN OBSERVER

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In Section 1, a methodology for a single observer f to control a pair of enemy objects $\mathbf{t}_1, \mathbf{t}_2$ moving along the shortest trajectory $\mathcal{T}$ is proposed, with the assumption that these objects are capable of directing dangerous high-speed mini-objects toward the observer. The trajectory $\mathcal{T}$ curves around given bodily convex sets and consists of arcs and straight segments that connect them. The observer is represented by a point or sphere $V_\varepsilon(f)$ of small radius $\varepsilon > 0$, at the center of which a radar is located. The first algorithm aims to track rectilinear motion, whereas the second algorithm aims to track the motion of objects along an arc. Each algorithm is presented in two versions, corresponding to the following cases: $\varepsilon = 0$, $\varepsilon > 0$. In Section 2, a methodology for an observer f to track a stream of objects $\mathbf{t}_i$ moving at a constant speed along a smooth geodesic arc Λ is proposed. The observer illuminates the objects as they pass through specified fixed control points t_j uniformly distributed along Λ. The observer selects a position $f_{i,j}$ from which it is possible to simultaneously illuminate two objects $\mathbf{t}_k$, $\mathbf{t}_l$ passing through specific points t_i, t_j, respectively, while avoiding encounters with mini-objects m_k, m_l, which are directed toward the observer. The observer's objectives may be as follows: (a) illuminate as many objects as possible (including repeatedly), determine their purpose, and detect their presence at different stages of the stream; (b) illuminating objects from a predefined group, and only those objects, etc.

Keywords: navigation, autonomous apparatus, trajectory, observer.

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