Summary: Densification events in time-evolving networks refer to instants in which the network density, that is, the number of edges, is substantially larger than in the remaining. These events can occur at a global level, involving the majority of the nodes in the network, or at a local level involving only a subset of nodes. While global densification events affect the overall structure of the network, the same does not hold in local densification events, which may remain undetectable by the existing detection methods. In order to address this issue, we propose WINdowed TENsor decomposition for Densification Event Detection (WINTENDED) for the detection and characterization of both global and local densification events. Our method combines a sliding window decomposition with statistical tools to capture the local dynamics of the network and automatically find the irregular behaviours. According to our experimental evaluation, WINTENDED is able to spot global densification events at least as accurately as its competitors, while also being able to find local densification events, on the contrary to its competitors.

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