

Iterative Knowledge Exchange Between Deep Learning and Space-Time Spectral Clustering for Unsupervised Segmentation in Videos

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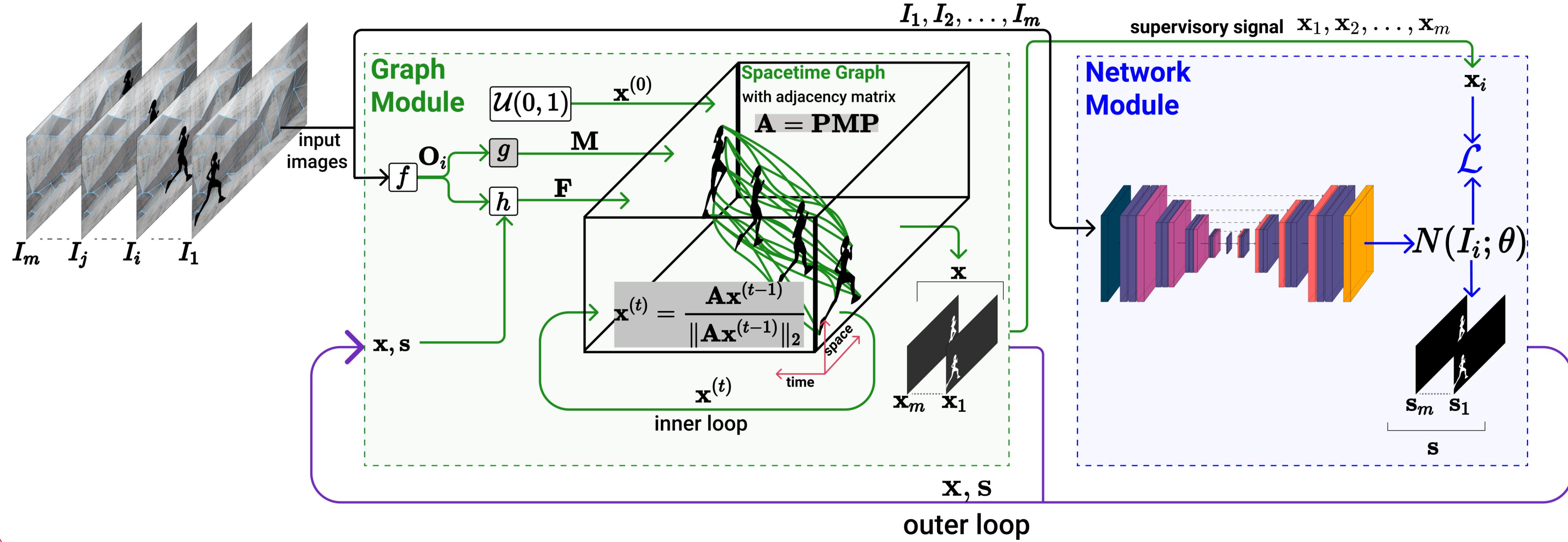


Accepted in IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI) 2021

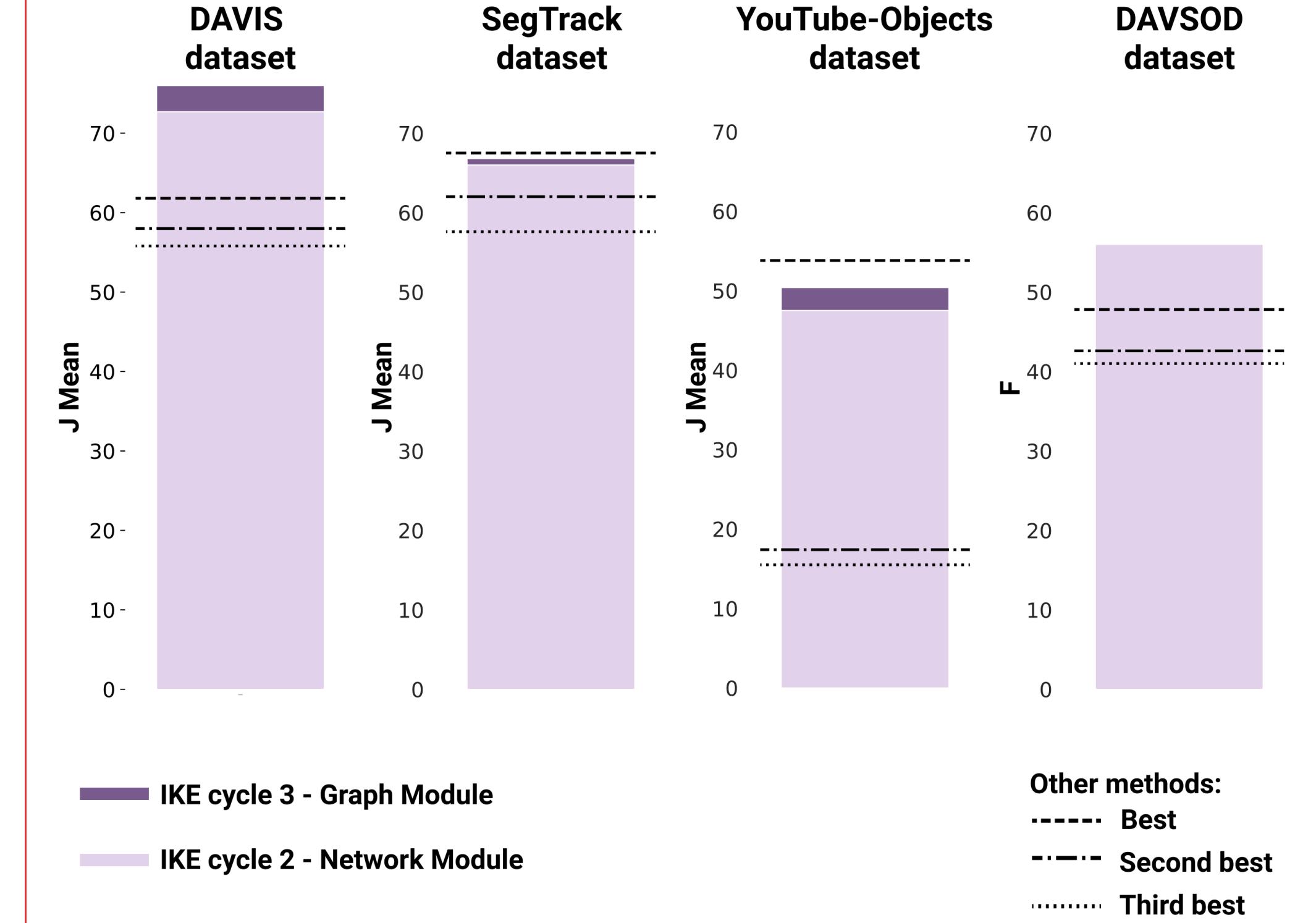
Contributions

- Our **Iterative Knowledge Exchange** brings face-to-face space-time spectral clustering and deep models to **learn as a self-supervised entity**.
- In the dense **Space-Time Graph** we formulate the object discovery and segmentation task as a spectral clustering problem and introduce an efficient algorithm with **convergence and optimality properties**.
- IKE relies on the assumption that the primary object has a distinctive motion and appearance pattern and forms the strongest cluster of the given scene.

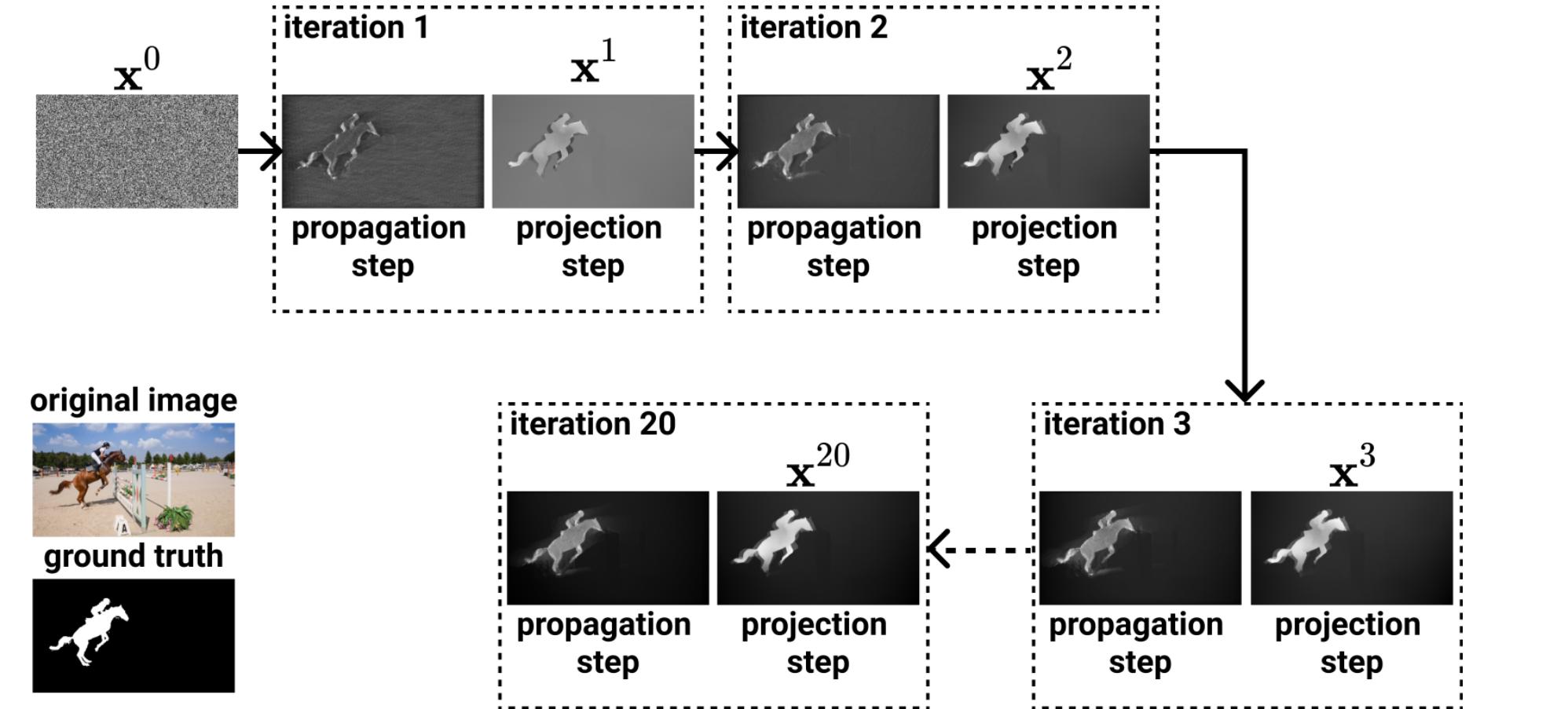
Iterative Knowledge Exchange (IKE)



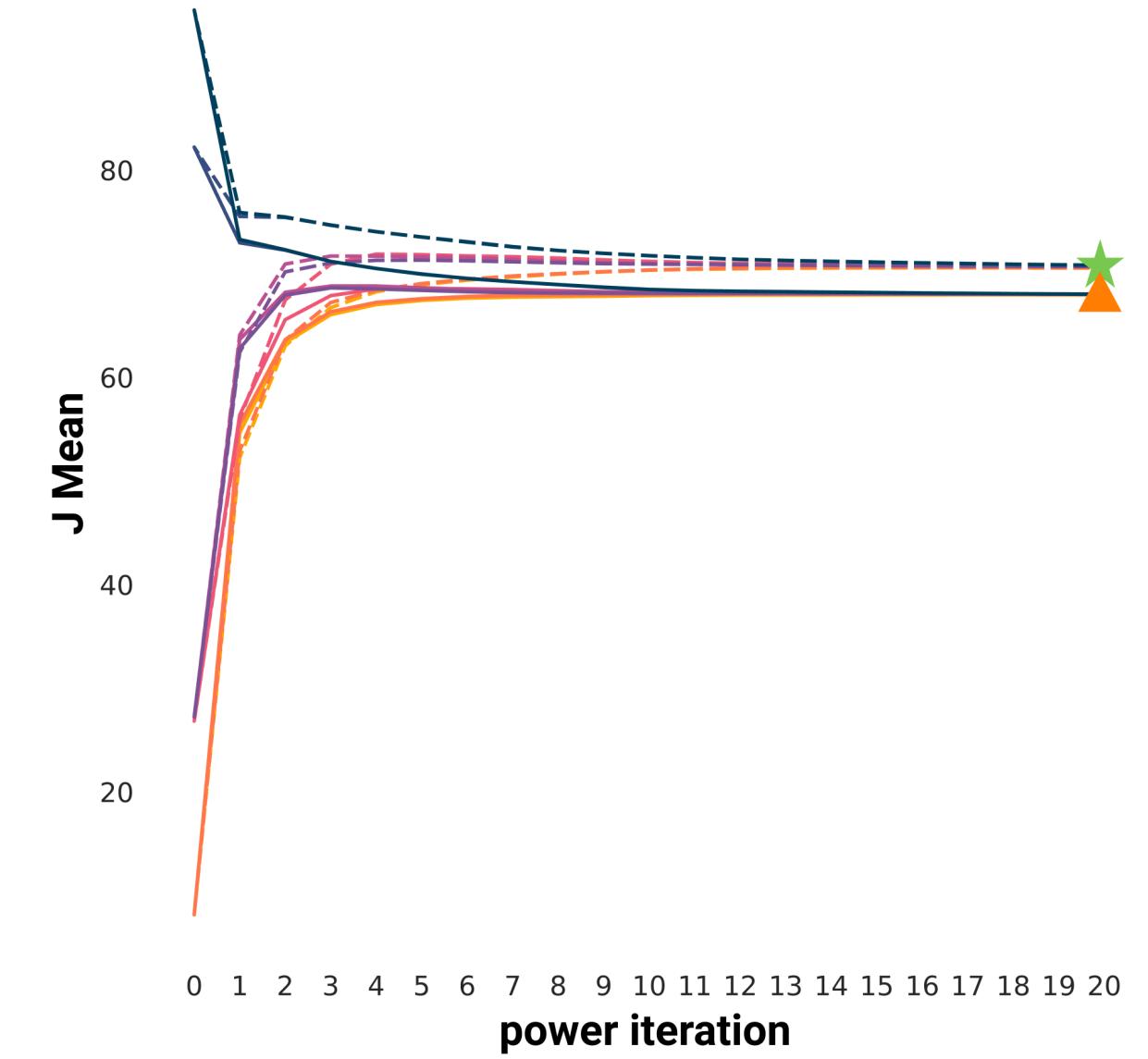
Quantitative Results



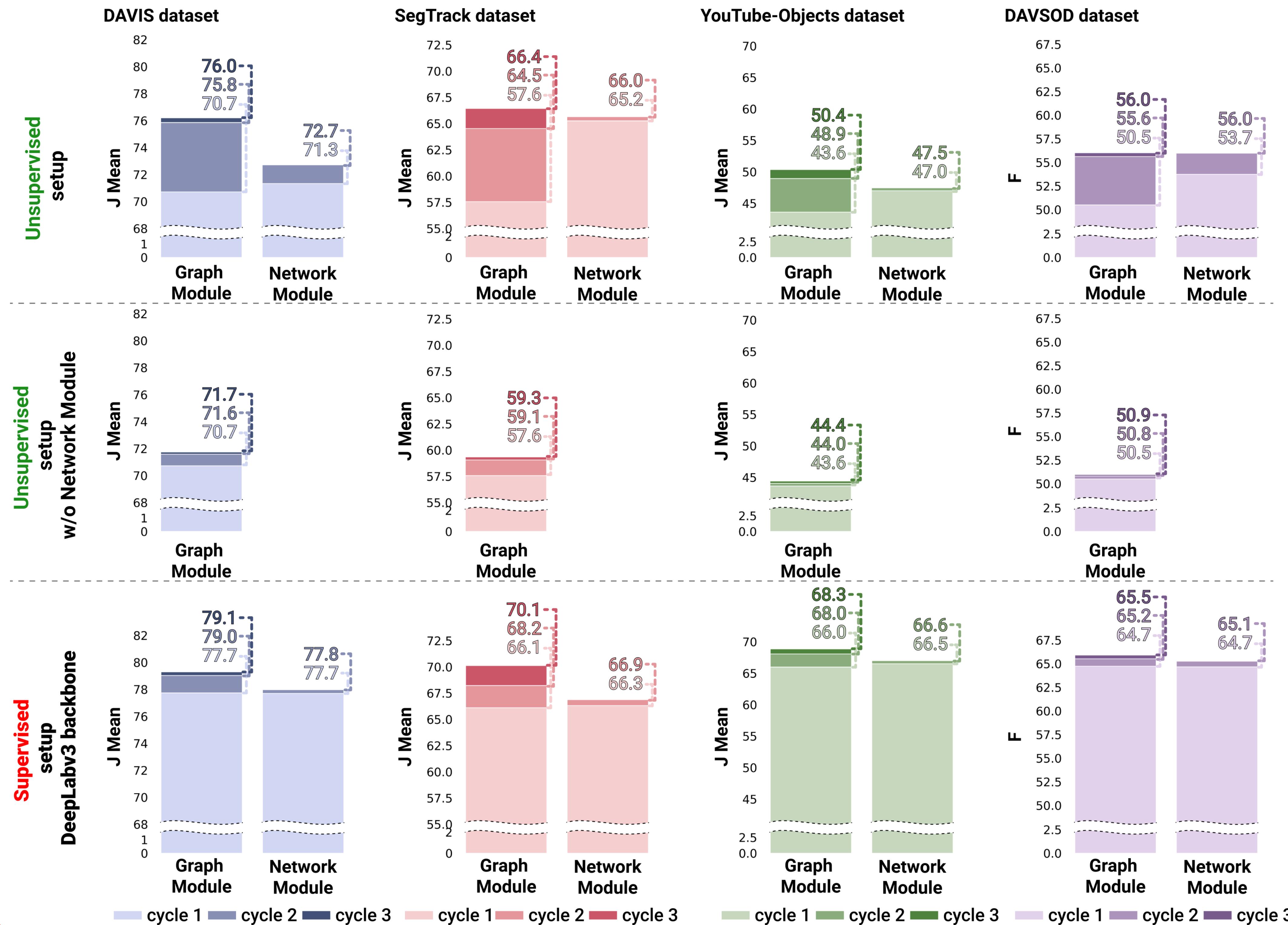
The Space-Time Graph



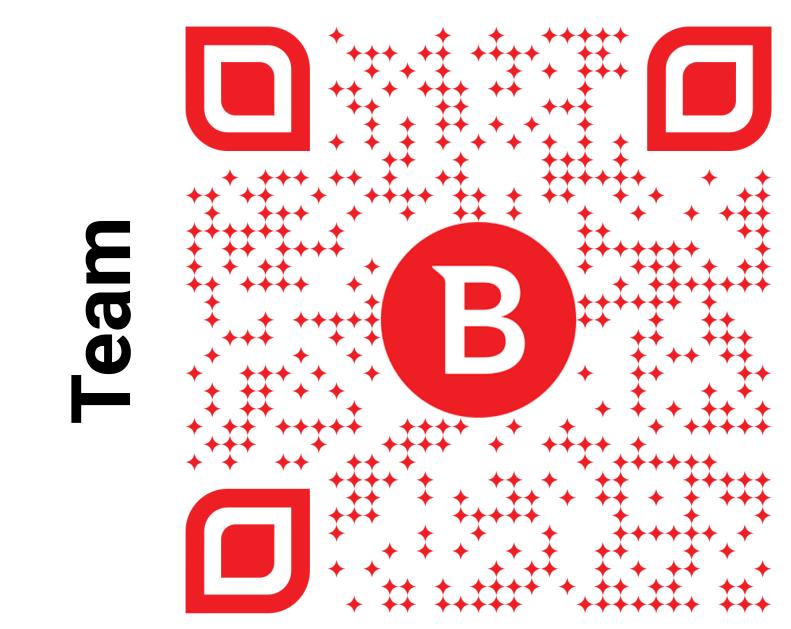
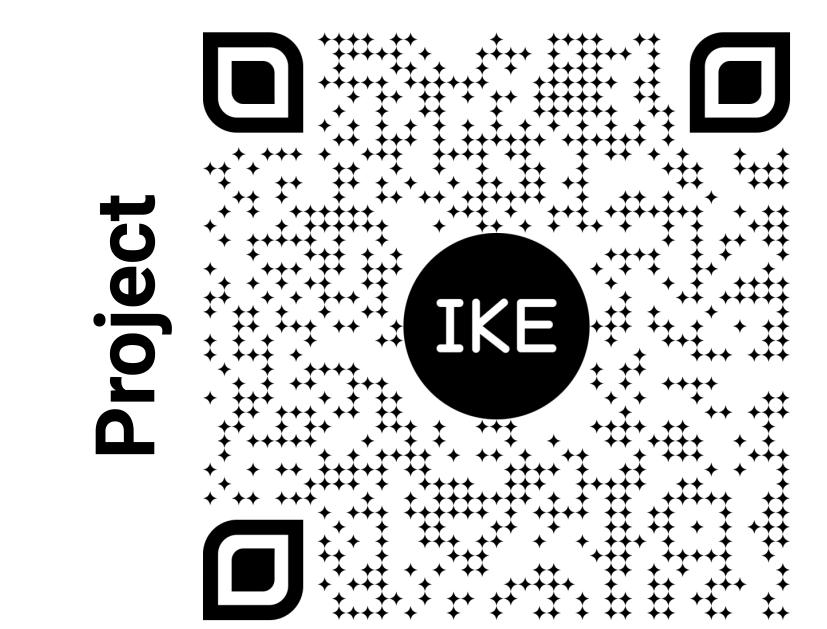
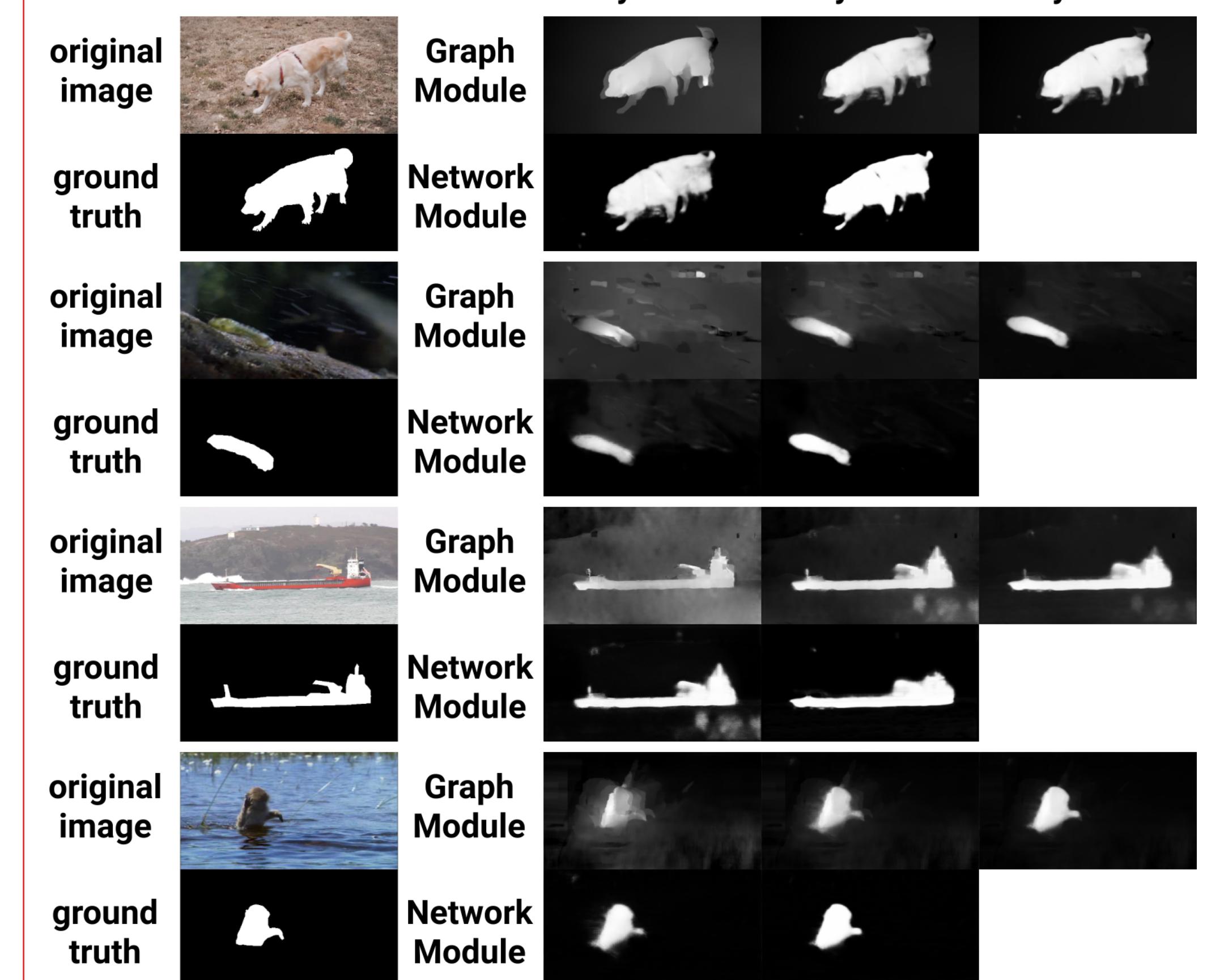
- Theoretically and experimentally proved convergence properties
- The optimal solution is the leading eigenvector of the Feature-Motion matrix \mathbf{A}



Performance Evolution



Qualitative Results



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