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Classifying structures in the ISM with Support Vector Machines: the G16.05-0.57 supernova remnant

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We apply Support Vector Machines -- a machine learning algorithm -- to the task of classifying structures in the Interstellar Medium. As a case study, we present a position-position velocity data cube of 12 CO J=3--2 emission towards G16.05-0.57, a supernova remnant that lies behind the M17 molecular cloud. Despite the fact that these two objects partially overlap in position-position-velocity space, the two structures can easily be distinguished by eye based on their distinct morphologies. The Support Vector Machine algorithm is able to infer these morphological distinctions, and associate individual pixels with each object at >90% accuracy. This case study suggests that similar techniques may be applicable to classifying other structures in the ISM -- a task that has thus far proven difficult to automate.

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