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Ashleigh Thomas, Kathleen Bates, Alex Elchesen, Iryna Hartsock* (irynakuz@ufl.edu),
Hang Lu and **Peter Bubenik**. *Topological data analysis of C. elegans locomotion and behavior*.

We apply topological data analysis to video of *C. elegans*, a widely-studied model organism in biology. We develop a quantitative summary of complex behavior that can be used as a tool for future biological experiments. Using this method, we are able to classify videos from different environmental conditions. Furthermore, we are able to match the bars in the barcode with corresponding worm behaviors and use representative cycles of persistent homology to produce synthetic videos of these behaviors. (Received September 03, 2021)