

1084-57-54

Michael Robinson*, 226 Gray Hall, American University, Washington, DC 20016. *The Whitney embedding theorem in signal processing.*

When can you infer the state of a system from measurements of a signal? In a surprisingly diverse set of situations, rather precise bounds can be obtained on the number of measurements needed to constrain a system from the Whitney embedding theorem. This result of differential topology is easy to state, easy to use, and intuitively satisfying. I will discuss its mathematical importance and advocate for its wider application within engineering. Its effectiveness within the context of opportunistic localization, navigation, and other example areas will be discussed. (Received August 14, 2012)