1163-51-965 **Elin Farnell*** (elinfarnell@gmail.com). *Encoding intrinsic variation in data: a survey of the use of Grassmann, flag, and Stiefel manifolds in data science.* Preliminary report.

As the extraction of information from large, high-dimensional datasets has become an ever more critical ingredient to scientific progress, it has become increasingly clear that finding the correct geometric framework to capture intrinsic structure in data can make or break analysis. One geometric framework that has been successfully exploited to capture intrinsic structure in data is the Grassmann manifold.

In this talk, we will provide background and context for the Grassmann manifold. We will also survey the broad range of applications of Grassmann manifolds and their generalizations in data science. Our ultimate hope for this work is that by compiling a single source that summarizes the way that fundamental ideas originating in "pure math" have improved analysis of real-world datasets, we will increase awareness and access to these tools in the data science community. (Received September 14, 2020)