

A Graph  $G$  is called a proper interval graph if it is the intersection graph of a set of intervals on the real line with no interval properly containing any other.  $G$  is called a proper circular arc graph if it is the intersection graph of a family of arcs on a circle with no arc properly containing any other. A similarity space is a set  $X$  along with a similarity measure  $s$ , where  $s(a, b) = s(b, a)$  is the similarity between elements  $a$  and  $b$  in  $X$ . A similarity space  $(X, s)$  is called a circular Robinson space if there exists a circular ordering that is consistent with the similarity measure. Applications of PCA and proper interval graph recognition include scheduling, traffic control, and DNA mapping. Applications of Circular Robinson space recognition include musicology, planar tomographic reconstruction, and hypertext orderings. I will present an algorithm for recognizing PCA graphs. The algorithm builds on a classic algorithm for recognizing proper interval graphs. I will also present a result stating that a binary similarity space (one where every similarity is either 1 or 0) is circular Robinson if and only if its similarity matrix is the adjacency matrix of a PCA graph. I will discuss how this result could be applied to Circular Robinson Space Recognition.