String graphs are the intersection graphs of curves in the plane. Asinowski et al. [JGAA 2012] introduced a hierarchy of VPG graphs based on the number of bends and showed that the hierarchy contains precisely all string graphs. A similar hierarchy can be observed with k-string graphs: string graphs with the additional condition that each pair of curves has at most k intersection points. We continue in this direction by introducing precisely-k-string graphs which restrict the representation even more so that each pair of curves has either 0 or precisely k intersection points with all of them being crossings. We prove that for each $k \geq 1$, any precisely-k-string graph is a precisely-$(k+2)$-string graph and that the classes of precisely-k-string graphs and precisely-$(k+1)$-string graphs are incomparable with respect to inclusion.

We also investigate the problem of finding an efficiently representable class of intersection graphs of objects in the plane that contains all graphs with fixed maximum degree. In the process, we introduce a new hierarchy of intersection graphs of unions of d horizontal or vertical line segments, called impure-d-line graphs, and other variations of the class with representation restrictions. We prove that all graphs with maximum degree $\leq 2d$ are impure-d-line graphs and for $d = 1$ this is the best possible. We also study the relationship between the d in the definition of impure-d-line graphs as a parameter and other graph parameters such as treewidth or clique-width.