*The nearest point* $P_k$ from a point list $L'$ to any given point $A$ is that point whose Euclidian distance $|\overline{P_k A}|$ is the minimum of all other points in the list $L'$.

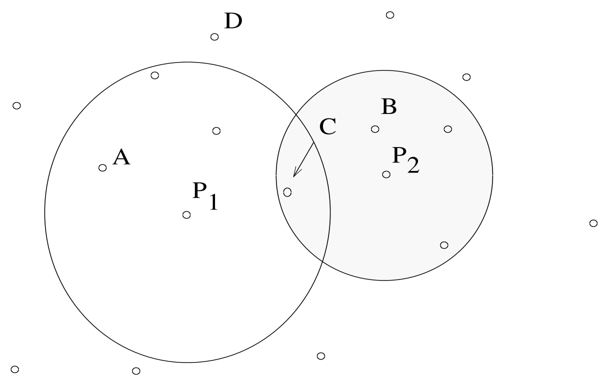


Figure 1: Local points

*A local point* is any point that is in the immediate neighborhood of a point $A$. The extent of the immediate neighborhood surrounding $A$ is defined by considering it to be a list $L'$ of $m$ points that are the $m$ nearest points to $A$. These local points play an important role in increasing the speed of surface construction. The actual number, $m$, of points that are considered local to a given point $A$, and its effect on the surface construction will be considered later. Figure 1 (where $m = 4$) illustrates several aspects of local points. First the physical extent of the local neighborhood depends on the number of points included in it, and it may not be the same for two reference points (as is the case for $P_1$ and $P_2$). Second, for any two given reference points ($P_1$ and $P_2$) there may be points (for example $C$) local to both. Finally, local points will not necessarily be uniformly distributed in the immediate neighborhood as is demonstrated by the distribution of local points about $P_1$.

*An edge* is a line connecting two points $P_i$ and $P_j$. An edge is usually denoted by: $\overline{P_i P_j}$, this notation also implies a vector $\vec{v}$ directed from $P_i$ to $P_j$. Associated with each edge are two other nearby peripheral points ($T_k$ and $T_m$ in Figure 2) which define the two triangles sharing the edge. Edges also have some peripheral data that is used to keep track of the exterior of the object being reconstructed.

All edges have two and only two end points. When a group of $n \geq 3$ points are found to be co-linear these $n$ points will be treated as defining $n - 1$ edges rather than just one edge. Once the surface is completed all edges will have two and only two triangles attached to them. These two triangles are defined by the two points $P_i$ and $P_j$ on the edge which they share and the two points $T_k$ and $T_m$ that are nearby (defined below) to both of the edge's end points. It is for this reason that the terms: "nearby points" and "triangles" may be used somewhat interchangeably.