三角形外心的求法

给定 dot1(dot1.x,dot1.y) dot2(dot2.x,dot2.y) dot3(dot3.x,dot3.y)

求外心(x,y)

我们根据圆心到顶点的距离相等,可以列出以下方程

$(dot1.x-x)^2+(dot1.y-y)^2 ==(dot2.x-x)^2 +(dot2.y-y)^2==(dot3.x-x)^2+(dot3.y-y)^2$

化简得

$2*(dot2.x-dot1.x)*x+2*(dot2.y-dot1.y)y==dot1.x^2+dot1.y^2-dot2.x^2-dot2.y^2$

$2*(dot3.x-dot2.x)*x+2*(dot3.y-dot2.y)y==dot3.x^2+dot3.y^2-dot2.x^2-dot2.y^2$

令

A1=2*(dot2.x-dot1.x)

B1=2*(dot2.y-dot1.y)

$C1=dot1.x^2+dot1.y^2-dot2.x^2-dot2.y^2$

A2=2*(dot3.x-dot2.x)

B2=2*(dot3.y-dot2.y)

$C2=dot3.x^2+dot3.y^2-dot2.x^2-dot2.y^2$

即

A1*x+B1*y=C1

A2*x+B2*y=C2

根据克拉默法则

$$x = \frac{(C1 \times B2) - (C2 \times B1)}{(A1 \times B2) - (A2 \times B1)}$$

$$y = \frac{(A1 \times C2) - (A2 \times C1)}{(A1 \times B2) - (A2 \times B1)}$$