\[ \hat{r}(t) \]
\[ T(t) = \frac{\hat{r}(t)}{\| \hat{r}(t) \|} \quad \text{unit tangent vector} \]
\[ N(t) = \frac{T'(t)}{\| T'(t) \|} \quad \text{unit normal vector} \]
\[ B(t) = T(t) \times N(t) \quad \text{unit binormal vector} \]

Since \( \| T \| = 1 \) constant
\[ T \perp T' \]
\[ so \quad T \perp N \]

And since \( B = T \times N \)
\[ B \perp T \quad \text{and} \quad B \perp N \]

The normal plane is \( \perp \) to \( T \)
The osculating plane is \( \perp \) to \( B \)
The osculating circle lies in this plane, with center on the line from the point along \( N \) and radius \( \frac{1}{k} \), where \( k \) is the curvature.