We consider a finite planar segment process in a circle, having a density with respect to the Poisson process. This density involves unknown parameters and a reference length distribution which is not observed. The aim is to estimate these quantities semiparametrically. The segment process is inhomogeneous, but it is isotropic. Combining the relation between the observed and reference length distribution and the maximum pseudolikelihood method we suggest an estimation procedure. Its properties (bias and variability) are investigated in a simulation study. In the last part we present two more complex models. The motivation is to model stress fibers observed in cultured stem cells.