

TWO LILYPOND SYSTEMS OF FINITE LINE-SEGMENTS

Daryl J. Daley
Sven Ebert
Günter Last

Abstract: line-segments constructed via the lilypond protocol, operating here on a given array of points $\mathbf{P} = \{P_i\}$ in \mathbb{R}^2 with which are associated directions $\{\theta_i\}$. At time zero, for each and every i , a line-segment L_i starts growing at unit rate around the point P_i in the direction θ_i , the point P_i remaining at the centre of L_i ; each line-segment, under Model 1, ceases growth when one of its ends hits another line, while under Model 2, its growth ceases either when one of its ends hits another line or when it is hit by the growing end of some other line.

The paper shows that these procedures are well defined and gives constructive algorithms to compute the half-lengths R_i of all L_i . Moreover, it specifies assumptions under which stochastic versions, i.e. models based on point processes, exist. Afterwards, it deals with the question as to whether there is percolation in Model 1. The paper concludes with a section containing several conjectures and final remarks.

2000 AMS Mathematics Subject Classification: Primary: 60D05; Secondary: 60G55.

Keywords and phrases: Hardcore model, point process, cluster, percolation, lilypond growth protocol.

THE FULL TEXT IS AVAILABLE [HERE](#)