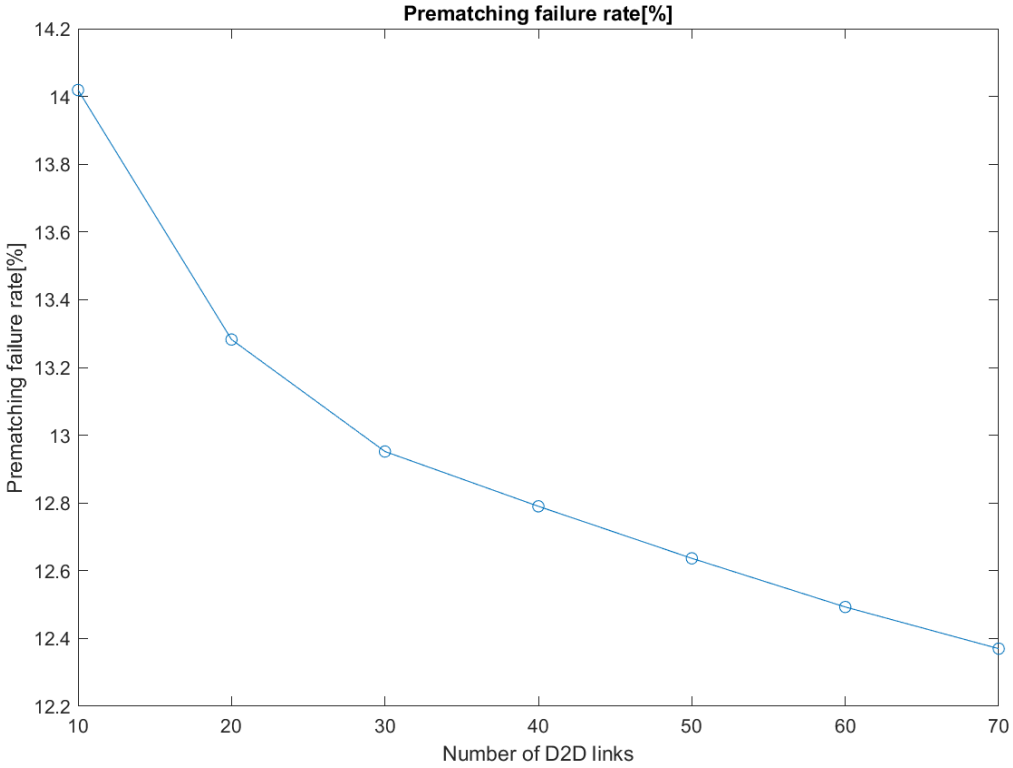
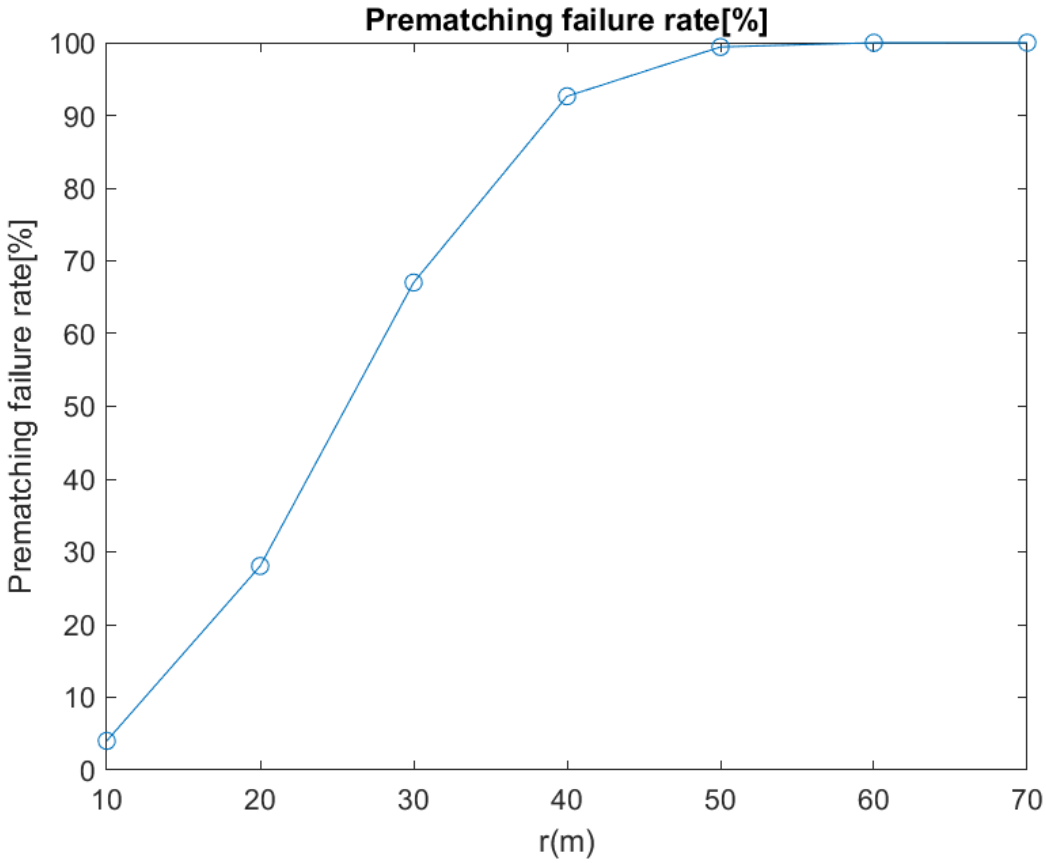
Date:2021-12-13

Make some adjustments to the previous script to simulate the pre-matching algorithm, and get more precise and smoother curve for Prematching failure rate



And the simulations of PFMR when fixing the number of D2D links and changing the Communication distance were also finished



Compared to the results simulated in the reference paper, it is a bit weird, the PFMR is jus too large when the distance is bigger than the 40m.

How to check if a function is convex

$$g(\lambda x - (1-\lambda)y) \leq \lambda g(x) + (1-\lambda)g(y),$$

for all x, y and $0 < \lambda < 1$.

This is a standard definition for determination of convexity of a function and can be applied to the function mentioned in the reference paper:

$$\mathrm{EE}_i^D = \frac{T_i^D}{\mathrm{EC}_i^D} = \frac{\log_2\left(1 + \frac{P_i^D h_i^D}{\left(P_k^C h_{k,i} + N_0\right) + \frac{N_1}{\left(1-\lambda_i^e\right)}}\right)}{P_i^D + 2P_{\mathrm{cir}} - \mathrm{EH}_i^D}. \quad (11)$$