

Lab 1: Mobility Models – part 2

CSE 4215/5431: Mobile Communications

January 25, 2013

We will conclude our investigation of mobility models this week by implementing one more model from the survey [1] called the *Gauss-Markov* model. This is defined formally in equation 15 in [1]. There is a typo in the second equation – σ^y is typed as σ^x .

1 Quantities to be recorded

Use the metrics that were defined in Lab 1.

2 Details of your simulation

Augment the simulator you used in part 1 of this assignment.

Assume a field of size 100×100 and $n = 10000$ nodes. Assume radio range $r = 10$. For the new parameters in this model, repeat your experiments with $\nu^x = \nu^y = 0$ and $\nu^x = \nu^y = 5$, $\sigma^x = \sigma^y = 1, 2, 3$. Do the same for $\alpha = 0, 0.25, 0.5, 0.75, 1.0$. Let the simulation run for 1000 time steps in each case. If this is too time-consuming on your platform then you can use a smaller number.

Make 3-d plots of the density after 1000 time steps over the 2-d field. Plot the other 2 criteria against time.

Repeat the experiments for when all nodes start at the center of the field and again for when all nodes are uniformly spaced (at fixed intervals).

3 Report and code

You will submit a report and all your code using the submit command on or before Feb 1.

You should have a lot of data to plot – present your results in a way that the reader can easily see the strengths and weaknesses of each model. Data visualization is a creative activity; put some thought towards creating meaningful, attractive plots. In the report, write a brief (a few paragraphs) description of what you did, design choices or assumptions you made (if any) and what you could infer from your results. In particular comment on the differences between the three models you saw from your plots.

Document your code so that the grader can easily follow what you are doing.

References

- [1] A Survey of Mobility Models, *Fan Bai and Ahmed Helmy*, Chapter 1 in *Wireless Adhoc Networks*, Kluwer Academic Publishers.