

Simulation Studies: Reversing the Incredibles



Tracy Camp
Colorado School
of Mines

Toilers

<http://toilers.mines.edu>

MANET Simulation Studies: The Incredibles, ACM's Mobile Computing and Communications Review, 9(4):50-61, 2005.

The Incredibles

- 151 papers presented at MobiHoc (2000–2005)
- 114 of 151 (75.5%) are simulation-based papers
- 34 of 114 (29.8%) did not state simulator used
- 98 of 112 (87.5%) did not include confidence intervals
- 106 of 114 (93%) did not address initialization bias
- etc.

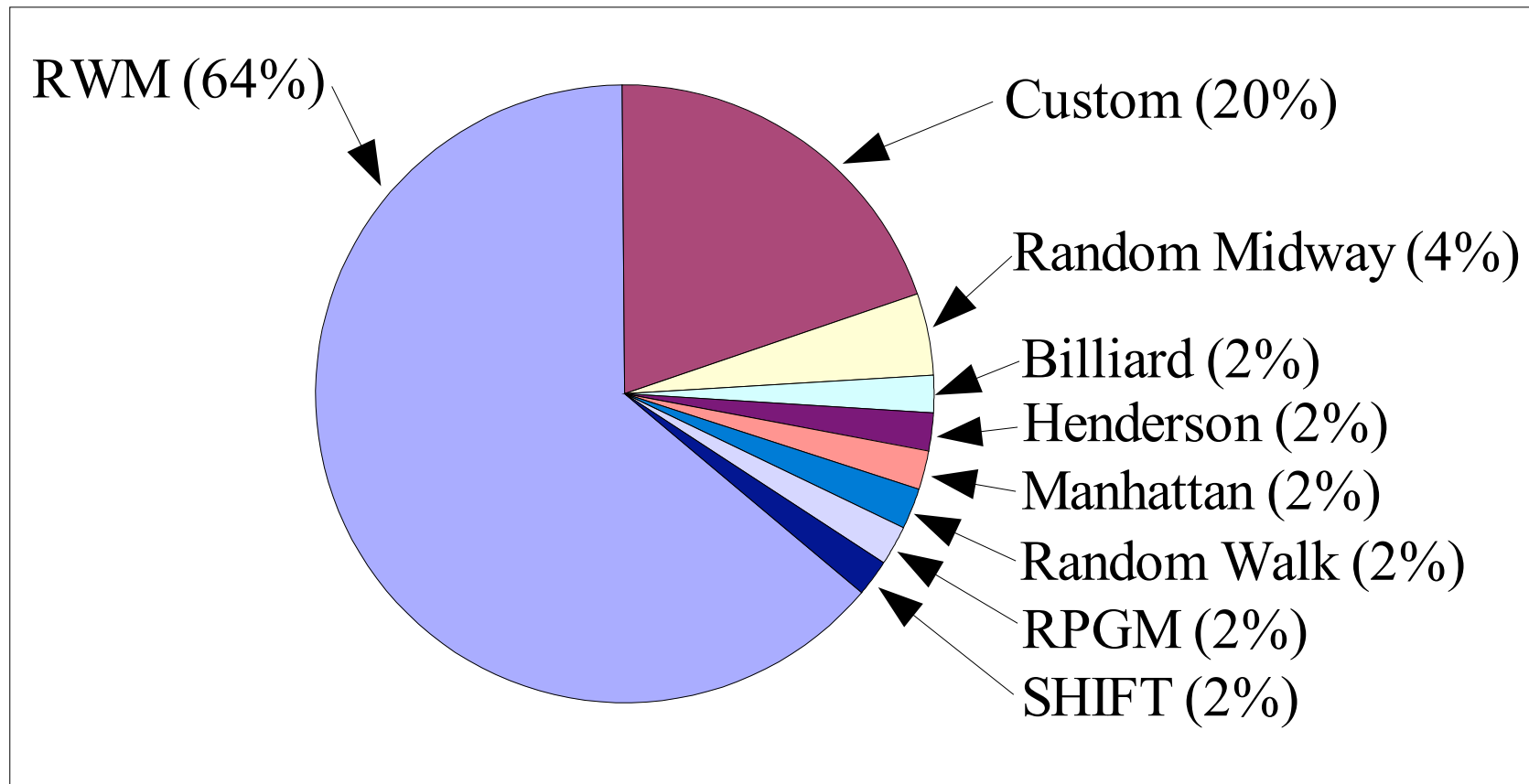
Our Incredible Efforts



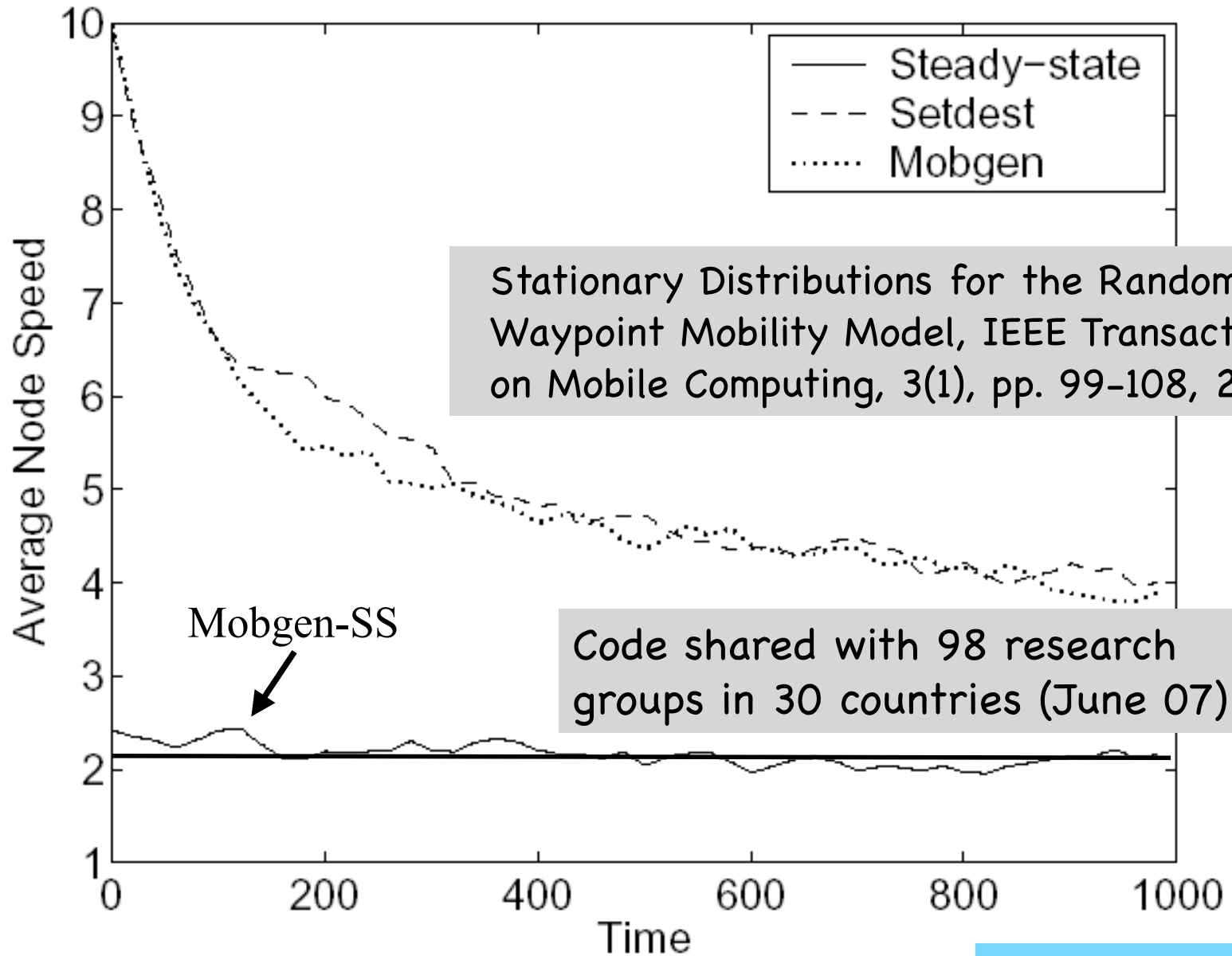
Initialization

Mobility Model Usage

(survey results)



Speed Range (0.001, 19.999), Pause Time 0



Future Work

Our Incredible Efforts



Simulation Scenarios

The Incredibles

- 151 papers presented at MobiHoc (2000–2005)
- 62 of 109 (56.9%) stated transmission range
- 58 of 109 (53.2%) stated size of the sim. area
- 62 of 109 (56.9%) stated # of nodes in study
- etc.

Comparing Scenarios

| Parameter | Scenario I | Scenario II |
|--------------|------------|-------------|
| Trans. Range | 40 m | 100 m |
| Width | 120 m | 300 m |
| Height | 240 m | 600 m |
| Node Speed | 10 m/s | 25 m/s |

MANET Scenarios

Standard: To rigorously evaluate generic MANET routing protocols, the average shortest-path hop count needs to be **large**.

Standard: To rigorously evaluate generic MANET routing protocols, only a **small** amount of network partitioning should exist.

Scenario Standards Calculator

Average Shortest-Path Hop Count: Hops

Average Network Partitioning: %

Perform Calculations

Output for 4 AspHops and 5% ANP

1x1 Area Aspect Ratio

91 Nodes

44.27 R² Area

1x2 Area Aspect Ratio

83 Nodes

39.55 R² Area

1x3 Area Aspect Ratio

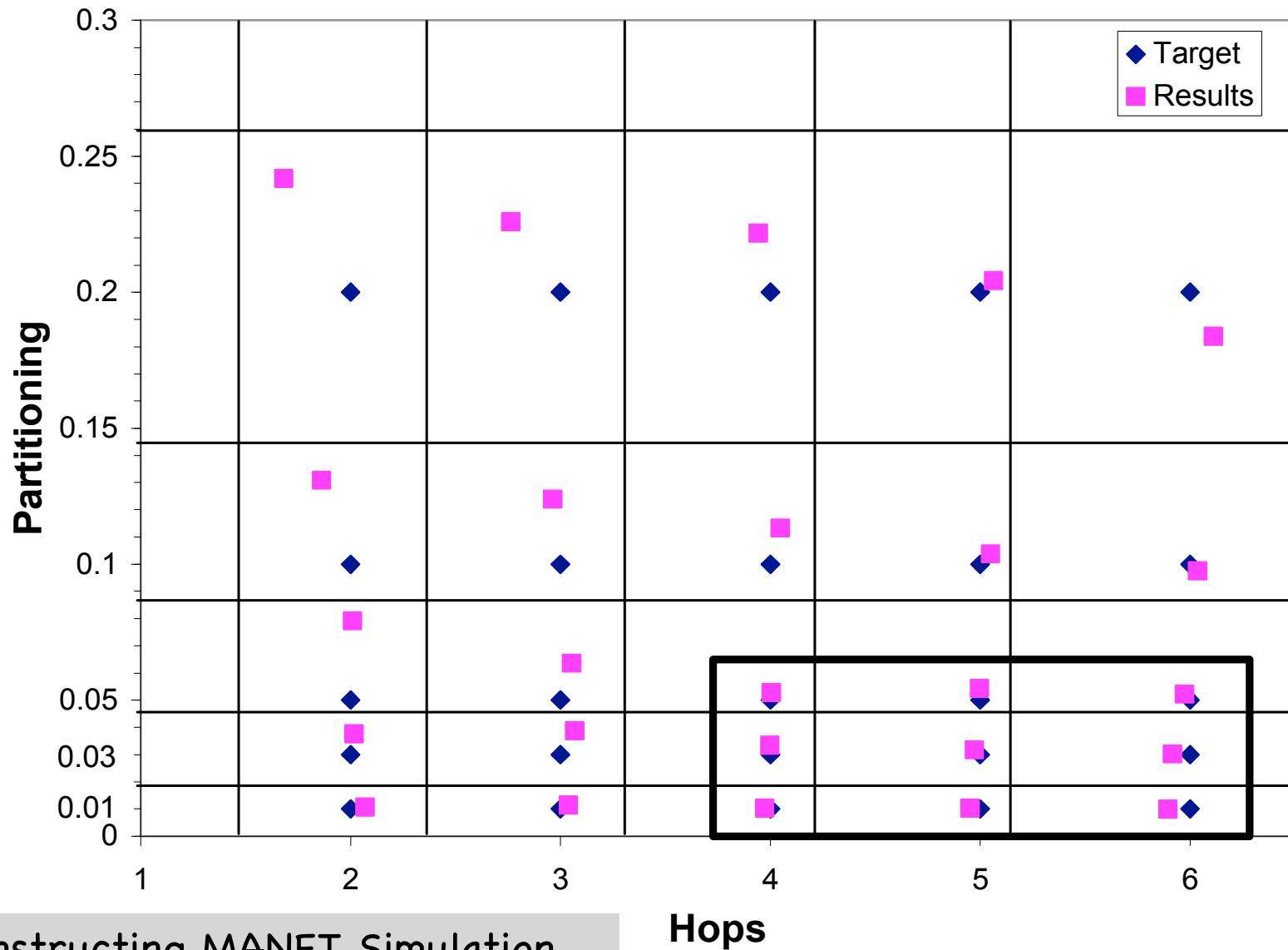
77 Nodes

33.89 R² Area

1x4 Area Aspect Ratio

71 Nodes

29.44 R²



Constructing MANET Simulation Scenarios that Meet Standards, to appear IEEE MASS, Oct. 2007.

Future Work

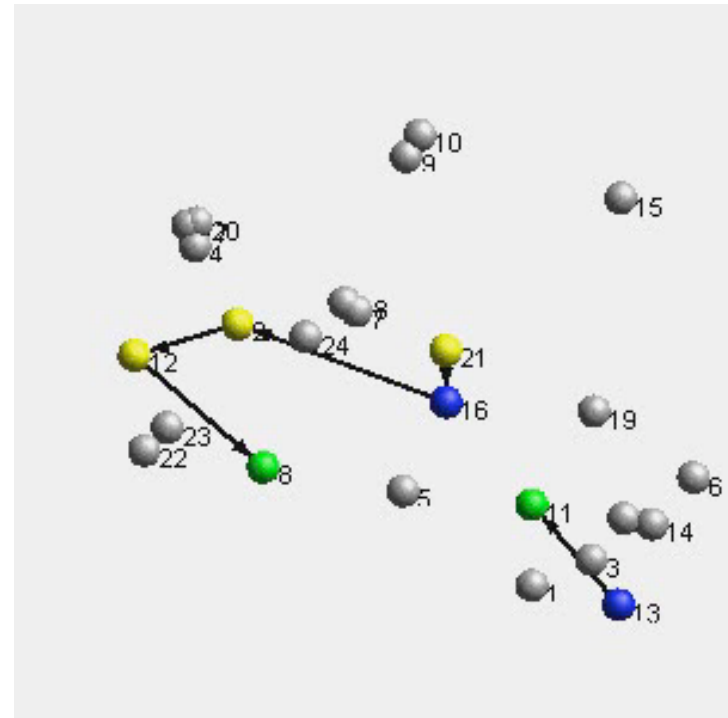
Our Incredible Efforts



A Visualization and Analysis Tool:
iNSpect

iNSpect

- interactive NS-2 protocol and environment confirmation tool (iNSpect)
- iNSpect shared with 359 research groups in 47 countries (as of June '07)



Future Work

Toilers Code Shared

12 code packages available by request
over 971 requests

from 56 countries

as of June 2007

Future Work

