## CNCL: Contents

- CNCL – C++ library for supporting event driven simulations

- Learning CNCL by examples

- CNCL project work instructions

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## Context

- Context:

  – Ad hoc network with mobile nodes using a simple mobility model

  – We are interested in certain simple stochastic properties of this process

- The assignment is about …

  – Creating a discrete event simulator for the above network
    - Requires handling of mobile movement but …
    - NO traffic needs to be simulated

## Ad hoc networks

- IETF working group: MANET (Mobile Ad Hoc Networks)

- Characteristics
  – Wireless meshed network where communication occurs over multihop paths
  – No centralized control (no base station)
  – Nodes communicate directly with other nodes that are immediately within radio coverage
  – Nodes act as relays for the traffic from other nodes
  – Nodes can join and leave the network

- Applications
  – Conferences and meetings
  – Tactical communications for military and emergency workers

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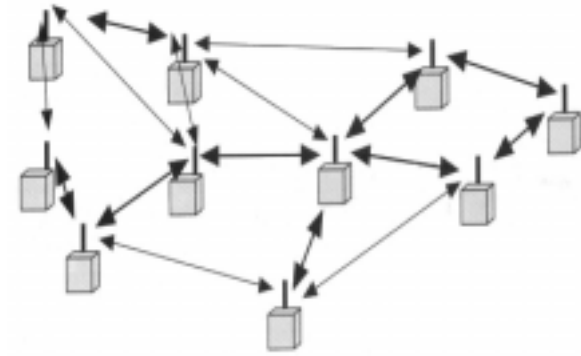
## Mobility modeling (1)

- Much of ad hoc networking research based on simulations

- Mobility model is an important component in the simulations

- Two broad classes of mobility models
  – Simple, so called synthetic models
  – Realistic models

- Mobility affects many aspects in performance of networking mechanisms
  – Traffic load, routing, reliability…

## Mobility modeling (2)

- Realistic models
  - Often utilizes measurement based information
  - More complex to utilize

- Synthetic models
  - Do not aim at imitating human movement
  - Mobility is random and the movement rules are as simple as possible
  - Facilitates implementation but movement is still sufficient for evaluating the performance of a given protocol
  - Also, models that include topography info, group mobility…

- Properties of simple models can be analyzed analytically
  - Impact of mobility on performance may also be analyzed

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RWP

Gauss-Markov model

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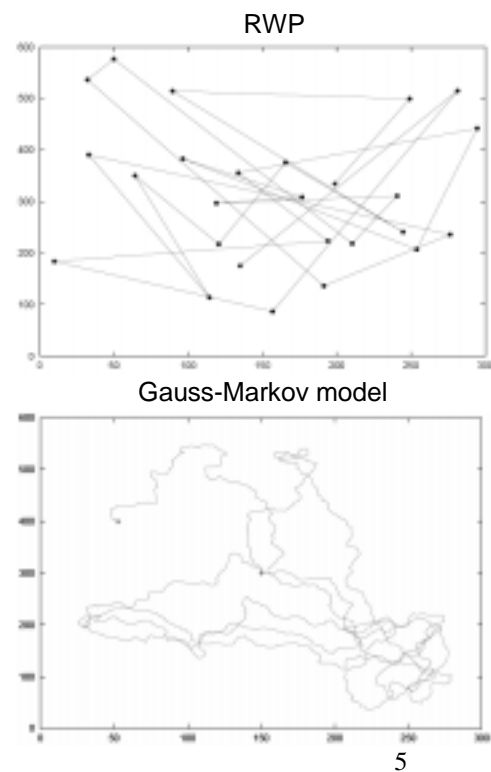
## CNCL assignment

- In this assignment a very simple mobility model is studied and some of its properties are verified

- You are given an example skeleton code for the task
  - Makefile, cnclexer.c

- Your task is to
  - implement the mobility model
  - implement the statistics collection
  - perform statistical analysis

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