Ad Hoc Wireless Network Traffic
Self-similarity and Forecasting

Wireless Seminars

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Article Reference

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Introduction

- Ad Hoc Wireless Networks

- Traffic load forecast
  - Find traffic patterns
  - Predictors

- Evaluate network capacity

- Determine battery power mode

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Traffic Pattern

- Assume self-similarity:
  - Similar statistical structure in a wide range of   time scales
  - High variability

- Assume long-range dependence (LRD)
  - Memory
  - High autocorrelation

- → Forecastable

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Prediction

- Apply a Fuzzy Logic System
  - 16 rules
  - Based on the 500 first units (training)
  - 4 antecedents used for forecasting

- Evaluation based on the RMSE

- Comparison with an LMS adaptive filter

Results
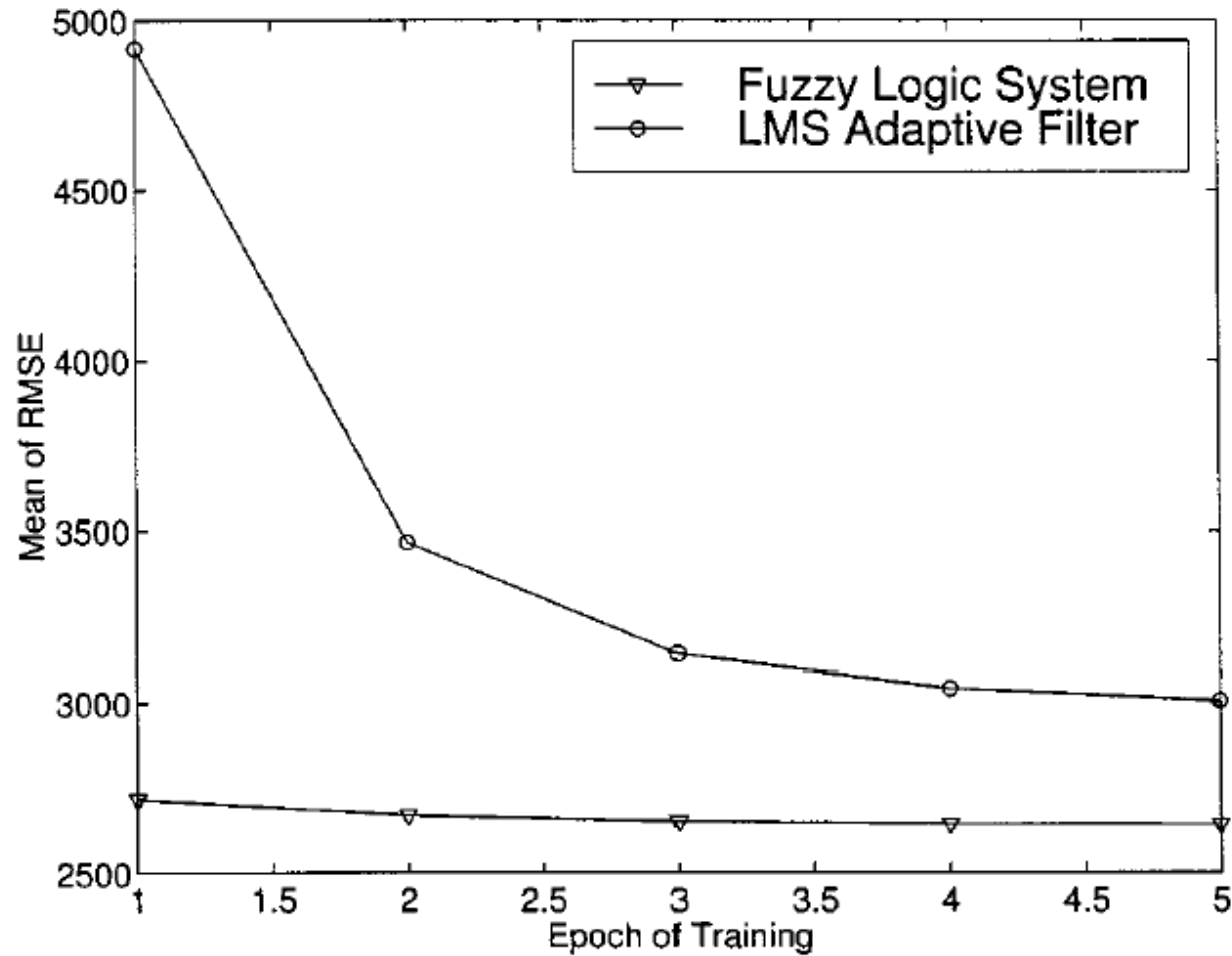
Conclusions

- Traffic load could be forecasted

- Accurate results

- Possibility of real-time prediction

- Self-similarity → Big assumption
  - Star Wars MPEG video: self-similar per se

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Apply this ideas to WSN…

- Environmental monitoring
    - Find self-similar patterns
    - *Self-similarity has been observed in physics but also in biology and even psychology and sociology*

- Information forecast in sensor and sink

- Reduction of messages to send

- Energy saving

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