

## Lecture 15

### Stochastic Service Networks (Q-Nets); Pooling in Q-Nets.

**Service Networks - the DCP (Harrison-Reiman) framework; Pooling**  
Fluid models, Traffic equations; Bottlenecks (Deterministic, Stochastic)  
Pooling: Redesigning Haifa's City-Hall = From a Jackson Network to M/PH/m.

**Jackson Networks (Exact analysis of approximate Markovian models).**

Models and Modelling (a la Regression)

The Product-Form Theorem

Performance analysis

Generalizations: state-dependent models, multi-type.

Support References: Jackson's papers; Serfozo's book.

**Non-parametric Jackson Networks: Approximate analysis (QNA).**

Network calculus;

Heavy traffic approximations.

Pooling a Queueing Networks (with Reiman - <http://iew3.technion.ac.il/serveng/References/pooling.pdf>).