Summary of examinable material

Large Deviations and Queues—Lent 2005—Damon Wischik


§3. An LDP for queue size. Statement and outline of proof of LDP for queue size. Watermark plots, and idea of effective bandwidth.

§4. Abstract large deviations. Definition of LDP and rate function. Rare events occur in the most likely way lemma. Uniqueness of rate function.

§5. Contraction principle, and extended example. Contraction principle. LDP for geometric and exponential random variables.


§7. The queue size function. The spaces $\mathcal{D}_\mu$ and $\mathcal{C}_\mu$ and the norm $\| \cdot \|$. Continuity of queue size function. Relationship between discrete-time and continuous-time versions.


You should appreciate the use of the contraction principle, and the idea of the principle of the largest term. You should be able to heuristically derive rate functions.

Items in italics refer to exercises.