Reading, Analyzing, and Presenting Scientific Papers

INF 5370, SPRING 2013

Classifying the type of contribution

- Elegant formalization of a problem that captures reality
- New or improved solution to an important and interesting problem
- New generic technique for analysis/solution/evaluation
- New analysis
- Better evaluation
- Survey

Important questions to consider

- Target application domain
  - What makes the work so suitable for this type of applications?
  - How general or easy is it to extend?
- Is the solution practical?
  - Example: the solution requires system engineer to define an exponential number of...
- Is the evaluation comprehensive and adequate?
  - Example: dependable system in failure-free settings or adaptive system with most parameters fixed

Important questions to consider (cont´d)

- What is the motivation for this work?
  - The authors certainly claim that it is important. What makes you believe it?
- Does the contribution and results correspond to the motivation? Do all pieces fit together?
- Where did the work fall short of your wild imagination? What extension would you like to see the most?
- Asking questions is always an option
  - Teachers, supervisors, colleagues
  - Even if you do a presentation alone

Guidelines for student presentations

- Present authors' claim regarding the work
  - Problem studied
  - Contributions of the paper
  - Relation to the state of the art
  - Depending on type of contribution and research method
    - Definitions, Requirements, Design, Algorithms, Implementations, Experiments, Evaluation, etc
  - Main results
  - Conclusion
  - Refer http://www.stanford.edu/~jacksonm/present.pdf

Guidelines for student presentations (cont´d)

- Criticism
  - Asking and concluding on the important questions
  - Guidelines: The Task of the Referee, Alan J Smith, UCB
- Questions and discussion
- Summary and conclusion of criticism

For presentations you will be better off skipping

- Formal parts
  - Unless it is a work on new proof techniques or formal methods
  - Formal notation and definitions
    - important for written papers
    - replace with intuition and examples
  - Theorem proofs and mathematical derivations
    - focus on the result and intuition behind the proof instead

For presentations you will be better off skipping (cont´d)

- Lengthy lists of related work
  - Instead present categories
  - Or one representative for each
- Fine-grain implementation details
  - Present the central part or implementation idea
    - Skip optimizations
  - Provide overview of pseudo-codes
    - and if require, present a few central lines
- Overly detailed architectural schemes
  - Papers typically include such schemes with dozens of entities and arrows, and annotations in a tiny font

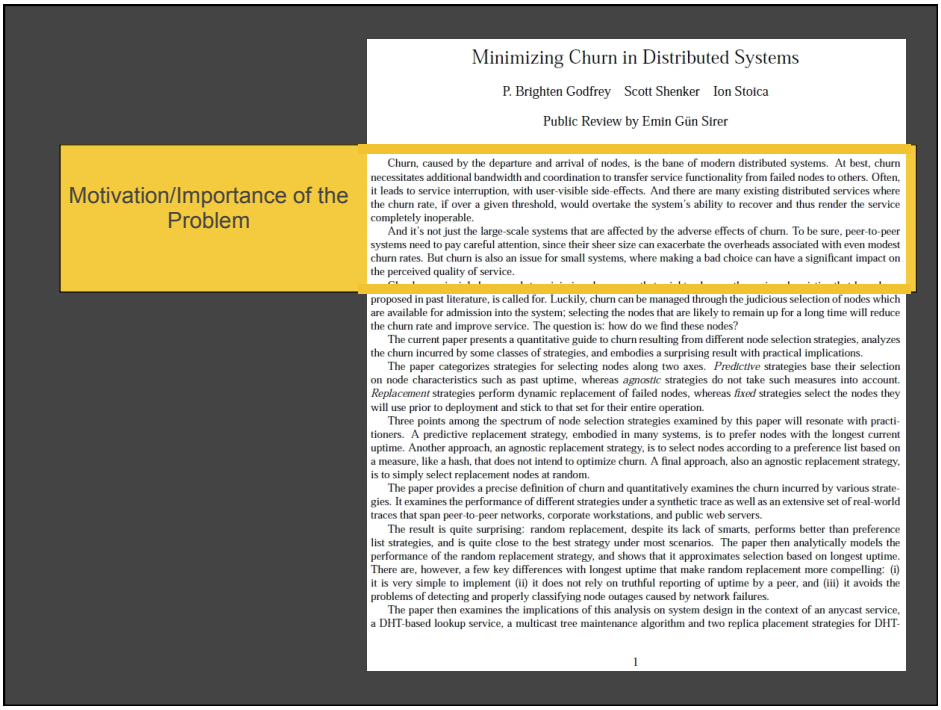
Guidelines for writing reviews

- Hypothesis and Context
  - brief problem description
  - contribution
  - summarize the central ideas, research methodology and supporting points
- Novelty of the research
  - a new perspective on the topic,
  - applicable to real-world situations,
  - comparison with other approaches
  - providing concrete examples of where the approach succeeds or fails.
- Assessment
  - your opinion of the research

Walk-through a sample review

- Research Paper: "Minimizing Churn in Distributed Systems"
- Public review available at Sigcomm 2006

Motivation/Importance of the Problem



Minimizing Churn in Distributed Systems

P. Brighten Godfrey Scott Shenker Ion Stoica

Public Review by Emin Gün Sirer

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The current paper presents a quantitative guide to churn resulting from different node selection strategies, analyzes the churn incurred by some classes of strategies, and embodies a surprising result with practical implications.

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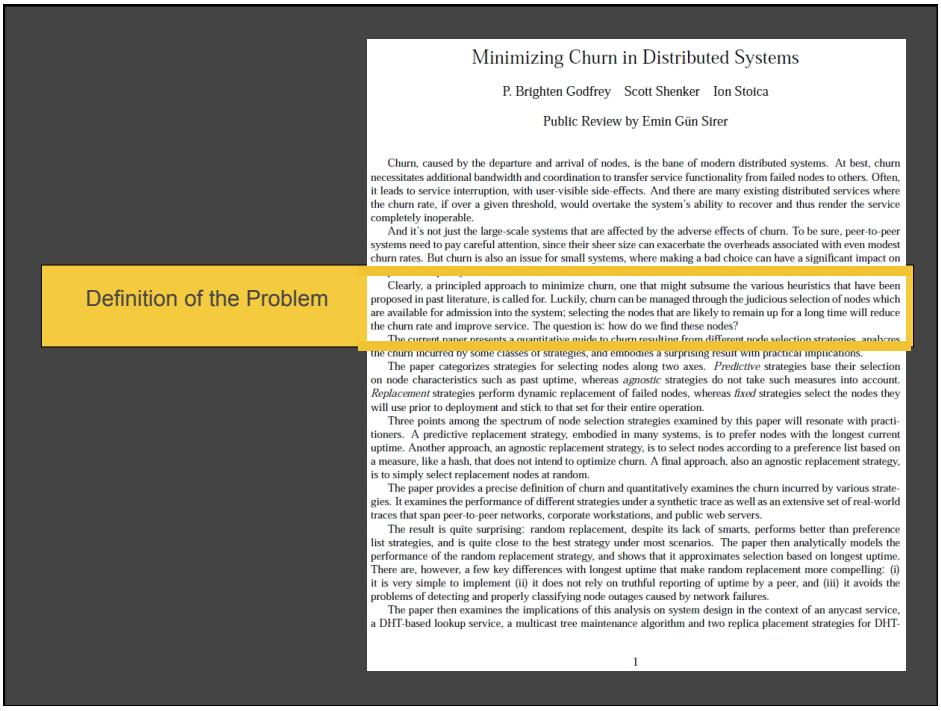
Definition of the Problem



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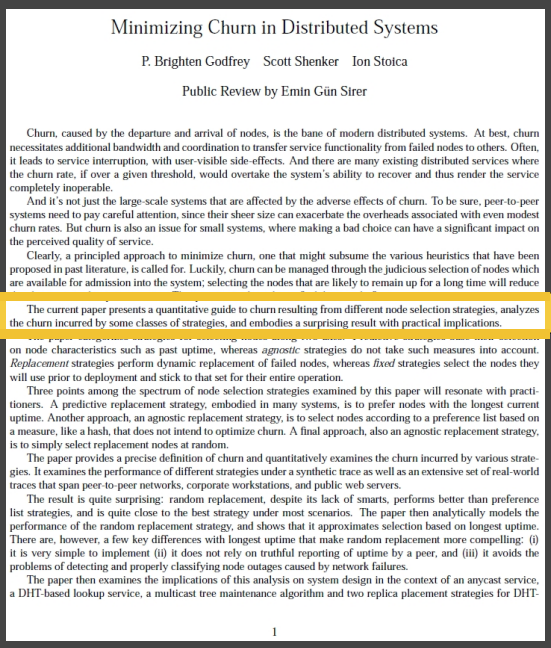
Overview of Contributions



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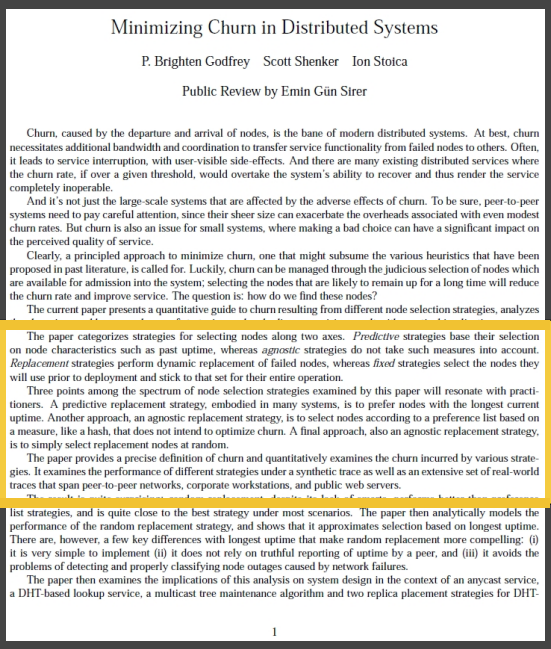

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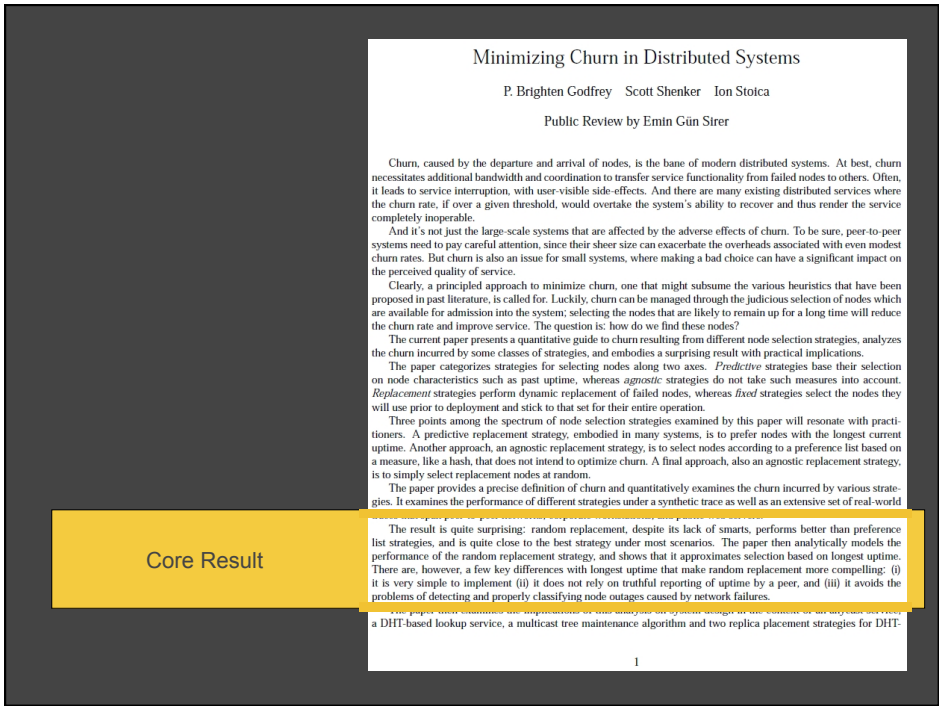

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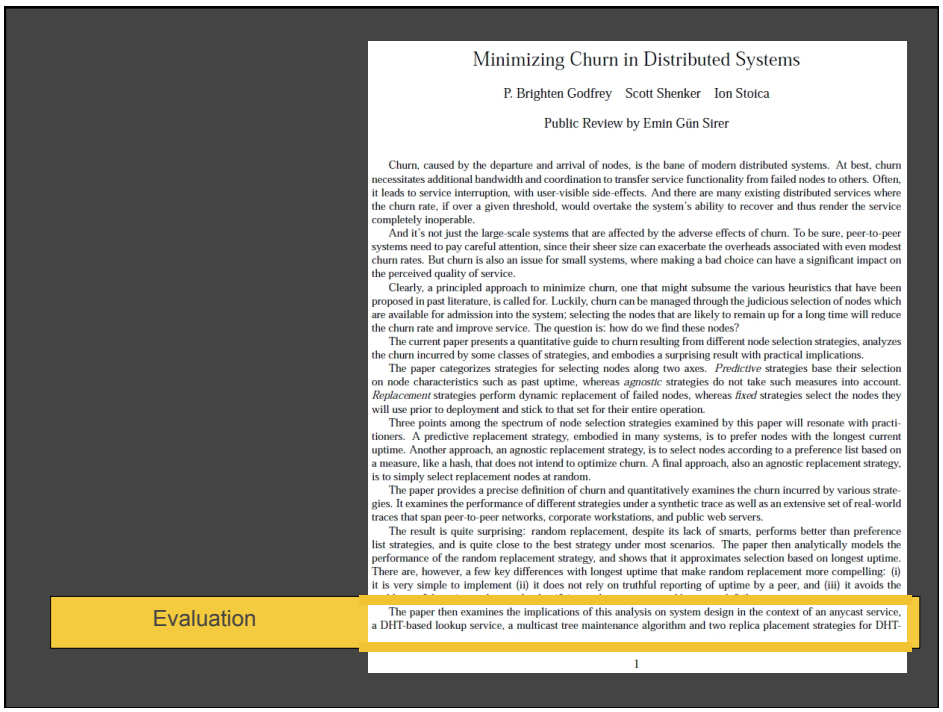

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Evaluation

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Open Issues/Problems

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Take-away Message

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Reading material

- Reading and Presenting Research Papers, http://www.cs.rpi.edu/academics/courses/spring99/robotics/paperdiss.html
- Review
  - ACM Computing Reviews guidelines, http://www.reviews.com/Reviewer/rev-info.html
  - "The Task of the Referee" by Alan Jay Smith, especially the "Evaluating a research paper" section
  - Sample Reviews from Sigcomm 2006, http://conferences.sigcomm.org/sigcomm/2006/discussion/index.php
- Presentation tips
  - http://www.stanford.edu/~jacksonm/present.pdf
  - http://www.spsu.edu/cs/faculty/bbrown/papers/presenting-research.html

INF5370, Roman Vitenberg & Abhishek Singh