Google Wave: Operational Transforms

Bachelor's essay: Project specification.

Participants:
Christoffer Hirsimaa, chir@kth.se
Martin Nycander, mnyc@kth.se

Supervisor:
Mads Dam, mfd@kth.se

February 9, 2010

1 Summary

Google Wave recently went into preview release and continues to extend the possibilities of online colaboration. It employs many interesting technologies. This project will focus on operational transforms.

2 Background

Google Wave is an attempt to renew the way we communicate today. The idea is to merge the many communication forms we use such as email, instant messaging, documents, blogs, forums and many more into a unified solution. Even more importantly it makes the communication instant and collaborative, but with these features there is a problem.

You can edit the same object or word at the same time from more than one location; but how does Google Wave control what will happen? The content needs to be editable in a way that it's kept up to date at all locations and won't introduce bugs.

Operational transformation is the algorithm(s) to keep an instance in the same state across multiple locations with as little effort as possible, or in other words concurrency control.

3 Problem

1. Which models for operational transforms exists? How do they work?
2. What is Google Wave's approach? How does it work?
3. How does Google Wave's approach compare to other techniques?

4 Project plan

Research. The source material must be read to summarize the current state of the art in the scientific area.

Analysis. The source material will then be analysed in such a way that an evaluation may be performed.

Documentation. The final stage of the project is to document the results in a scientific essay.

5 Schedule

2010/02/11. Research "completed".

2010/03/03. First revision.

2010/03/10. Mid-way hand-in.

2010/04/15. Release candidate.

2010/05/03. Final hand-in.

References

[1] "Operational Transforms". http://en.wikipedia.org/wiki/Operational_transformation

[2] Ellis, C.A.; Gibbs, S.J. (1989). "Concurrency control in groupware systems". http://portal.acm.org/citation.cfm?id=66926.66963&coll=portal&dl=ACM

[3] Chengzheng Sun; Xiaohua Jia ; Yanchun Zhang ; Yun Yang ; David Chen. (1998). "Achieving convergence, causality preservation, and intention preservation in real-time cooperative editing systems". http://portal.acm.org/citation.cfm?doid=274444.274447

[4] David Wang, Alex Mah. "Google Wave Operational Transformation". http://www.waveprotocol.org/whitepapers/operational-transform

[5] " Google Wave introduction". http://wave.google.com