

# Routing in Question & Answer Networks

Simon Fleming

Foundations of Software Systems  
School of Informatics  
University of Sussex

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# Introduction: Q&A

- ▶ We all need help from time to time. . . work, life and play
- ▶ What is electronic question and answering (Q&A)?
- ▶ Exploit 'the wisdom of the crowds'
- ▶ Contextual, subjective, opinions and advice ✓

YAHOO! ANSWERS

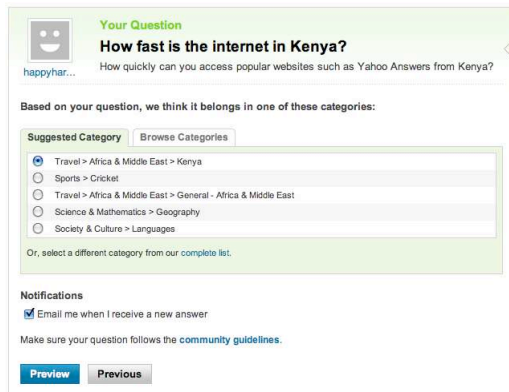



 stackoverflow

Google™  
Answers

# Existing Q&A Technologies: issues?

- ▶ Identity and accounts - **privacy?**
- ▶ Knowledge Markets - public search
- ▶ **Human Attention!!** resource to optimise
- ▶ Centralized - bottleneck, failure, control and ownership



 **Your Question**

**How fast is the internet in Kenya?**

happyhar... How quickly can you access popular websites such as Yahoo Answers from Kenya?

Based on your question, we think it belongs in one of these categories:

**Suggested Category** [Browse Categories](#)

- ☒ Travel > Africa & Middle East > Kenya
- ☐ Sports > Cricket
- ☐ Travel > Africa & Middle East > General - Africa & Middle East
- ☐ Science & Mathematics > Geography
- ☐ Society & Culture > Languages

Or, select a different category from our [complete list](#).

**Notifications**

☒ Email me when I receive a new answer

Make sure your question follows the [community guidelines](#).

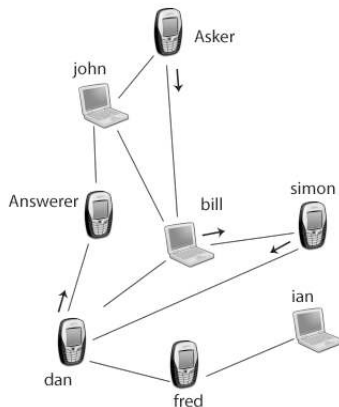
[Preview](#) [Previous](#)

# My research: overview

- ▶ Distributed question and answer service
- ▶ Q&A over ad-hoc networks: mobiles, laptop, access points. . .
- ▶ Decentralized - lower requirements on single nodes
- ▶ Investigation through *simulation*

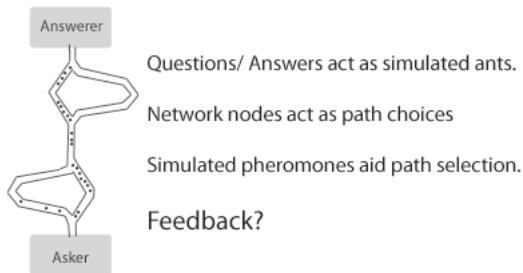
## My research: aims

- ▶ Routing strategies to reduce the **attention required from network users** to get **satisfactory answers**.
- ▶ Improve privacy through **plausible deniability**
- ▶ A robust/usable and effective Q&A service



# My research: tactics

- ▶ Swarm intelligence: stigmergic approach - dynamic networks
- ▶ Strengthening/reinforce links to desirable network members (experts)
- ▶ Reward good behaviour, punish bad behaviour, prevent 'bombardment'
- ▶ Experiments comparing stigmergic against **flooding** and **random** approaches



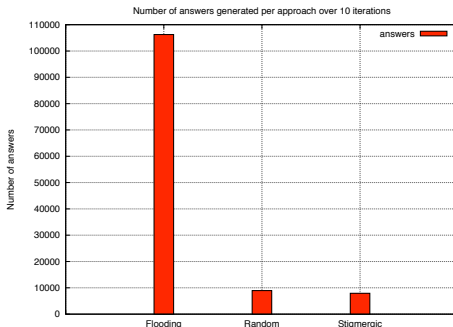
# simulation: simple user model

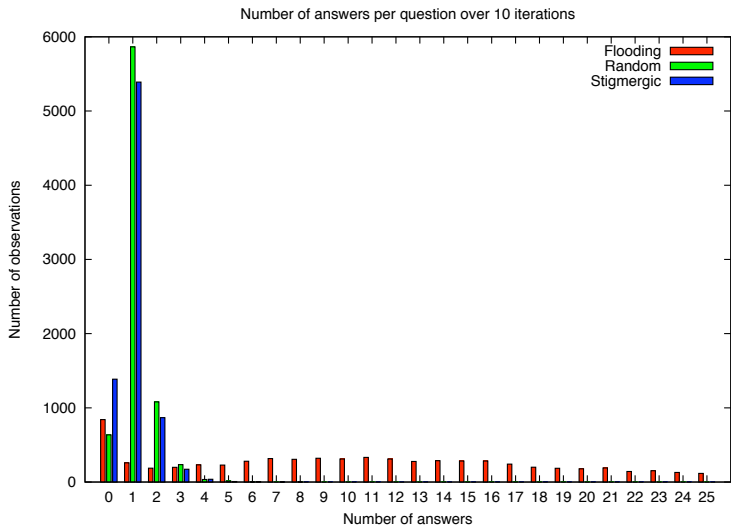
- ▶ Yahoo! answers database: distributions, facts & figures
  - ▶ **Yahoo! Webscope Datasets Catalog (L6)** *Yahoo! Answers Comprehensive Questions & Answers version 1.0*  
<http://www.stanford.edu/class/cs345a/YahooData.pdf>
- ▶ Range of interest categories
- ▶ Users answer questions which match interests
- ▶ Priority based question queues
- ▶ Markov model (attention / idle)
- ▶ Question answering monkeys!!



# Preliminary Results

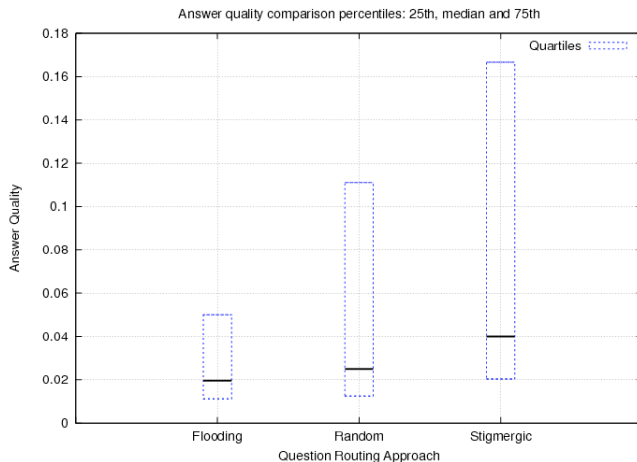
- ▶ Comparison show stigmergic/random approaches will dramatically reduce required attention in comparison to flooding (number of answers)
- ▶ Attention consumed by: reading, thinking(\*) and writing(\*) responses per user.  $f(\text{number of answers})$





# Preliminary Results

- Answer quality is improved with a stigmergic approach.



# Conclusion & Future Work

- ▶ Stigmergy helps to locate network \*experts\*.
- ▶ ...while reducing user attention
- ▶ ...while improving privacy through plausible deniability
- ▶ → Improve user model, answer quality assessment, network realism and fine tune stigmergic routing approaches

Fin.

Thank you kindly for listening!  
=) questions?

# References

- ▶ *PlanetSim: Object Oriented Simulation Framework for Overlay Networks:*  
<http://projects-deim.urv.cat/trac/planetsim/>
- ▶ *Yahoo! Webscope Datasets Catalog (L6):*  
<http://www.stanford.edu/class/cs345a/YahooData.pdf>