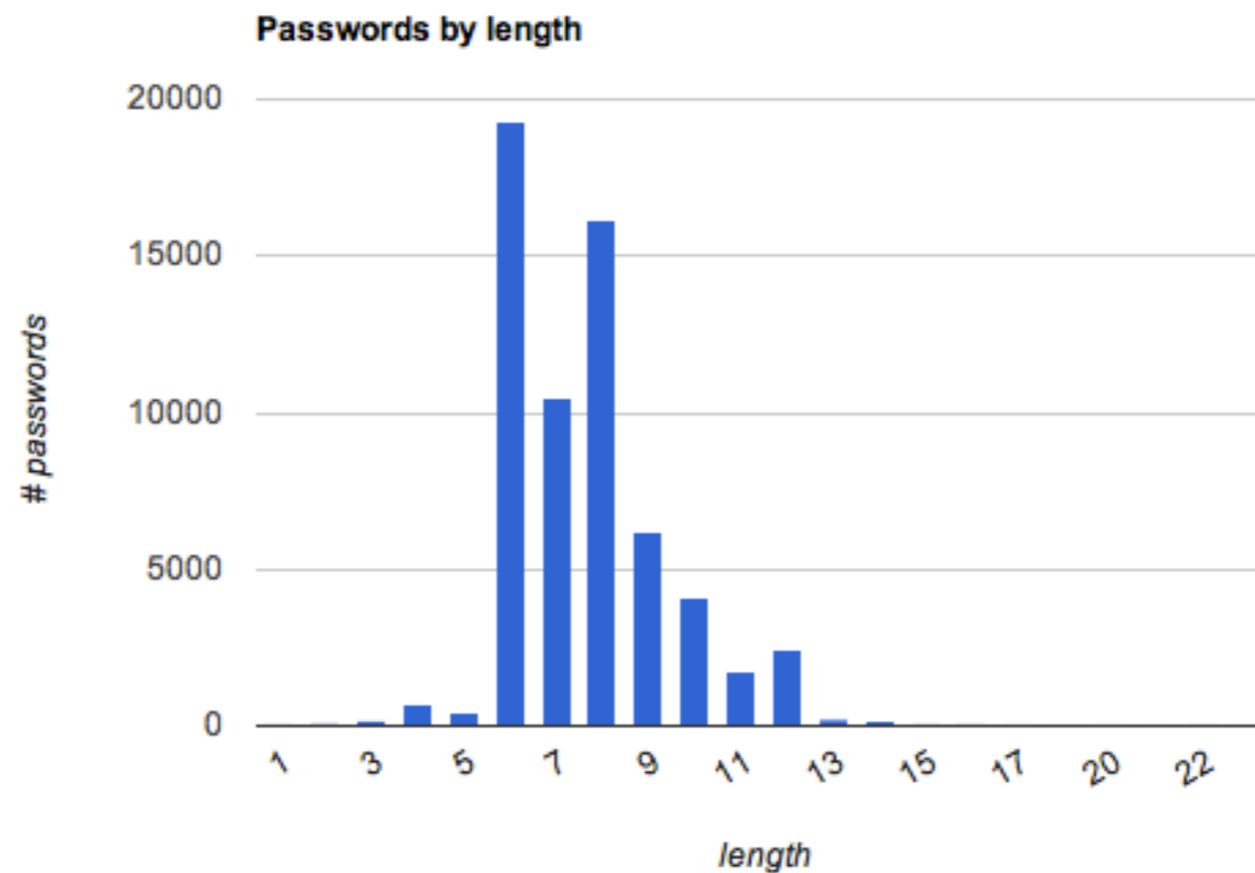


Data Analysis

- Qualitative and quantitative data require different methods to be analysed
 - e.g. you cannot analyse numerical data using grounded theory
- Method should be appropriate to research question
- Amount of data collected should be enough to test hypothesis
 - If you have few data points you will not achieve statistical significance

Quantitative Data

- Start by looking at the data graphically
 - e.g. frequency distribution



- Look for trends in the data

Quantitative Data

- Fit a statistical model to the data
- Statistical models allow us to make predictions about the phenomenon being studied
- The closer the fit between model and data the more confident we can be in our predictions
- The mean is a very simple statistical model
 - e.g. You could predict that if you ask a random person what their email password length is, it will be 7.7 characters long

Quantitative Data

- Statistical test used depends on:
 - Number of predictor (independent) and outcome (dependent) variables
 - Type of variables: categorical vs. continuous
- If you wanted to the relationship between two categorical variables:
 - Effect of type of online advertisement (image vs. text) on purchases (yes vs. no)
 - You would use Pearson's chi-square test

Q&A for finding a test

Which Stats Test

Knowing which statistical test to use to answer your question is tricky.
Use this simple tool to help narrow down the options!

Suggested Test - Repeated measures ANOVA

Based on your answers the test that is best suited for you is a [repeated measures ANOVA](#).

[← Previous](#)

[↻ Start over](#)

Bayesian analysis

- Develop a parametrised model of the system that you analyse that generates a probability distribution of possible outputs, based on the parameters
- Reverse the model so it generates parameters based on the output
- Provide your measurements, and get a probability distribution over the parameters

Is a website blocking Tor

- Send two probe packets from a Tor node and a non-Tor node
- If a website blocks Tor, both Tor probes will get no response but both non-Tor probes will be responded to
- But probes and their responses could be lost, so some websites that seem to be blocking Tor might not actually be

Do you see what i see? Differential treatment of anonymous users (Khattak et al.)

System model (blocking Tor)

	$P(\{T, NT\} B)$
$T = 0$	1
$T \in \{1, 2\}$	0
$NT = 0$	n^2
$NT \in \{1, 2\}$	$(1-n)^2 + 2n(1-n)$

Bayes Law

$$P(A | B) = \frac{P(B | A) P(A)}{P(B)}$$

- $P(A | B)$ – probability of observing event A, given that B has been observed to be true (posterior)
- $P(A)$ – probability of observing event A (prior)
- $P(B) = P(B | A)P(A) + P(B | \neg A)P(\neg A)$

Inverse system model

	$P(B \mid \{T, NT\})$
$T = 0$	$b / ((a+w)n^2 + b + d)$
$T \in \{1, 2\}$	0
$NT = 0$	$bn^2 / ((a+b)n^2 + d + w)$
$NT \in \{1, 2\}$	$b / (a + b)$

Qualitative Data

- Most qualitative data analysis starts with the identification of themes
- Themes are patterns in the data
- Analysis involves:
 - Coding (tagging) interesting passages of text (e.g. interview transcript) consistently
 - Grouping codes into themes
 - Interpret themes and relate them to research questions
 - e.g. You find several quotes in interviews you made about passwords that mention they are “too long”; “too complicated”; “difficult to memorise”; “if I don’t write them down I will forget for sure”

Qualitative Data

- Thematic analysis stops at the identification of themes
- Grounded theory analysis goes further
 - You group codes into categories
 - Identify properties and dimensions of each category
 - e.g. category “surveillance” has the property “frequency” with a range going from “never” to “often”
 - Relate categories to each other
 - e.g. “high peer pressure” links to “soft drugs consumption”
- Find the main category, i.e. the phenomenon, and write theory around it

Qualitative Data

- Seems complex and vague

but

- In the end it boils down to spending time looking at the data and making sense of it
- When in doubt stay close to the data
 - i.e. do not make wild interpretations, instead make the codes match the corresponding passage of text as much as possible

Presenting Results

- What did you find out as a result of your study?
- Use figures in addition to text:
 - Figures condense information
 - Scientific paper have page limits, but more importantly...
 - The reader has attention limits
 - You want to capture and retain their attention and interest, not bore them!

Presenting Results

- There should be a logical structure in the way results are reported
- You are taking the reader on a journey with you
- You are telling a story
- Even if the story is very rigorous and detailed scientifically, it is still a narrative

Presenting Results

- Use descriptive statistics that give an overview of the sample composition
- Present themes identified in qualitative analysis
 - Describe each one
 - Exemplify with quotes from data

Presenting Results

- Describe statistical tests conducted
 - Explain why specific test was chosen?
 - e.g. was data parametric, non-parametric?
 - Describe relationship between variables
 - Were your hypotheses supported?
 - Each statistical test should follow certain conventions for how it is reported
- Leave implications of results for the discussion / conclusions section

Conclusions & Further Work

- May be merged with discussion of results
- Reference to study's purpose and hypothesis
- Recap of major findings
- Interpretation of the results
 - Why did I get these data/find these relationships?
 - What does it imply?
 - Why was my hypothesis rejected?
 - How do my results compare to similar studies?
 - Why were they similar/different?

Conclusions & Further Work

- Limitations of study
 - What prevents findings from being internally valid or generalisable (externally valid)?
 - Sample size?
 - Sample composition?
 - Lab setting?
 - Researcher bias?
 - Learning /boredom effects?
- Academic honesty

Conclusions & Further Work

- What are the implications of your study?
 - For other researchers?
 - For practitioners?
 - What recommendations can you make to them?
 - In which way would they improve their processes / products?

Conclusions & Further Work

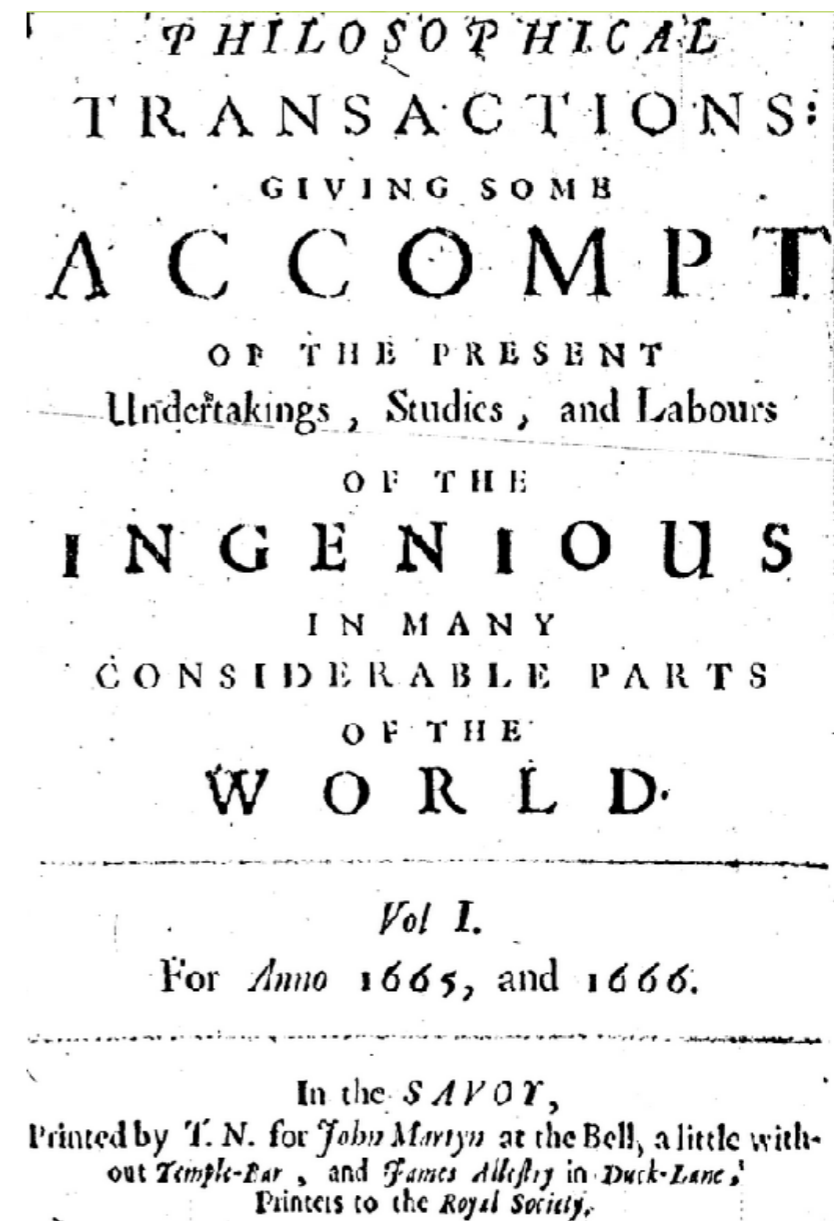
- What is the contribution of your study?
- Substantive
 - New theory?
 - Update to existing theory?
 - New explanation for a phenomenon already identified?
 - Identification of new phenomenon?
- Methodological
 - First to solve new problem?
 - First to solve old problem using existing method?
 - Development of new method?
 - Testing of new method?

Conclusions & Further Work

- Future research
 - Which new research questions did your study reveal?
 - What would be a good follow-up to your study?
 - Which gaps in your research field would it cover?
 - How could you address the limitations of the current study in a new one?

Journals

- Scientific journals started in 1665
 - French Journal des sçavans
 - English Philosophical Transactions of the Royal Society
 - Beginning of systematic publishing of research results
 - There are currently thousands of scientific journals



Journals

- A scientific/academic journal is a:
 - “[...] peer-reviewed periodical in which scholarship relating to a particular academic discipline is published. Academic journals serve as forums for the introduction and presentation for scrutiny of new research, and the critique of existing research. Content typically takes the form of articles presenting original research, review articles, and book reviews”
- Source: Wikipedia at http://en.wikipedia.org/wiki/Academic_journal

Journals

- Academic articles have two roles
 - Link authors to readers interested in their field
 - Peer-review of work by experts in the area
- Most scientific fields use journals for publishing
 - Computing is somewhat an exception

Conferences & Workshops

- Scientists meet and exchange ideas
- Conference/workshop normally consists of
 - Oral presentations of paper
 - Questions and answers
 - Published proceedings (often alternative to journal in Computing)
- Papers may be shepherded
 - Author is assigned a shepherd – less adversarial

Conferences & Workshops

- Workshops also popular form of conferences
 - Tend to be more collaborative or interactive
 - e.g. New Security Paradigms Workshop (NSPW) – www.nspw.org
- Proceedings may be published in electronic form only
 - Association for Computing Machinery's Digital Library
 - IEEE Xplore Digital Library

Conferences Submission Process

- Programme chair selects programme committee
- Call for papers is distributed
 - Area(s) of interest
 - Paper format
 - Anonymous (blind) or not anonymous
 - Dates
 - Submission date
 - Notification date
 - Proceedings/Pre-proceedings date
 - Conference date(s)
 - Post-proceedings deadline (if applicable)

Conferences Submission Process

- Call for papers – see Moodle for examples
- WikiCFP - <http://www.wikicfp.com/cfp/>

	Jul 8, 2013 - Jul 8, 2013	Philadelphia, USA	Jan 15, 2013
ACM/Springer MONET SI 2013	Developments in Security and Privacy-preserving mechanisms for Future Mobile Communication Networks		
	N/A	N/A	Dec 23, 2012
SOUPS 2013	Symposium On Usable Privacy and Security (SOUPS)		
	Jul 24, 2013 - Jul 26, 2013	Newcastle, UK	Mar 8, 2013
PAIS 2013	6th International Workshop on Privacy and Anonymity in the Information Society		
	Mar 22, 2013 - Mar 22, 2013	Genoa, Italy	Dec 24, 2012
HotPOST 2013	The Fifth International Workshop on Hot Topics in Peer-to-peer computing and Online Social neTworking		
	Jul 8, 2013 - Jul 8, 2013	Philadelphia	Feb 26, 2013
AI & Society (Special Issue) 2013	Special issue of AI & Society on agent-based modelling, socio-technical systems, public policy, sustainability		
	N/A	N/A	Mar 1, 2013
ECRJ-FMC 2013	Electronic Commerce Research Special Issue on Advances in Security and Privacy for Future Mobile Communications		
	N/A	N/A	Feb 15, 2013
ACSD 2013	13th International Conference on Applications of Intelligent Systems and Informatics		
	Jul 8, 2013 - Jul 10, 2013	Barcelona, Spain	Jan 25, 2013 (Jan 18, 2013)
Mobile and Wireless Communications 2013	Security, Privacy, Trust, and Resource Management in Mobile and Wireless Communications		
	N/A	N/A	Jan 31, 2013 (Oct 10, 2012)
BRAACV 2013	Biometric Recognition: An Application to Computer Vision [InterScience Journal Special Issue]		
	May 20, 2013 - Aug 5, 2013	N.A.	May 20, 2013
PEIAC 2013	2013 Paris European International Informatics Conference		
	Jun 9, 2013 - Jun 11, 2013	Paris	May 17, 2013
NLDB 2013	8th International Conference on Application of Natural Language to Information Systems		
	Jun 19, 2013 - Jun 21, 2013	London, UK	Feb 1, 2013
HotWiSec 2013	The 2nd ACM Workshop on Hot Topics in Wireless Network Security and Privacy		
	Apr 19, 2013 - Apr 19, 2013	Budapest, Hungary	Dec 1, 2012
MCSS 2013	6th International Conference on MULTIMEDIA COMMUNICATIONS, SERVICES & SECURITY		
	Jun 6, 2013 - Jun 7, 2013	Krakow, Poland	Feb 1, 2013
PASSAT 2013	Privacy, Security, Risk and Trust		
	Sep 8, 2013 - Sep 14, 2013	Washington D.C., USA	Apr 15, 2013
Connections 2013	Making Connections: Interdisciplinary Approaches to Cultural Diversity		
	N/A	N/A	Feb 15, 2013
IFIP Summer School 2013	Eighth International Summer School Privacy and Identity Management for Emerging Services and Technologies		
	Jun 17, 2013 - Jun 21, 2013	Nijmegen, the Netherlands	Feb 15, 2013
ECSQARU 2013	European Conference on Symbolic and Quantitative Approaches to Reasoning with Uncertainty		
	Jul 7, 2013 - Jul 10, 2013	Utrecht, The Netherlands	Feb 3, 2013
SPH 2013	Security and Privacy in Healthcare IT (special track in CBMS2013)		
	Jun 20, 2013 - Jun 22, 2013	Porto, Portugal	Jan 31, 2013

Make sure you are aware of the main focus of the conference!

Conferences Submission Process

- Authors submit papers by submission date
- Programme chair assigns submitted papers to members of programme committee
 - Usually 2–4 reviews per paper
 - Rules for conflicts of interest
 - A programme committee member may forward paper to external reviewer with more expertise
- Once all reviews carried out programme committee discusses which to accept
 - Usually 20-40% of submitted papers

Acceptance Rate NSPW

Abstract	Authors	References	Cited By	Index Terms	Publication	Reviews	Comments	Table of Contents
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Title [NSPW '12 Proceedings of the 2012 workshop on New security paradigms](#) [table of contents](#)

General Chairs [Richard Ford Florida Institute of Technology, USA](#)
[Mary Ellen Zurko Cisco, USA](#)

Program Chairs [Cormac Herley Microsoft Corporation, USA](#)
[Tara Whalen Office of the Privacy Commissioner of Canada](#)

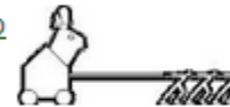
Pages 87-104

Sponsors ACSA Applied Computer Security Associates

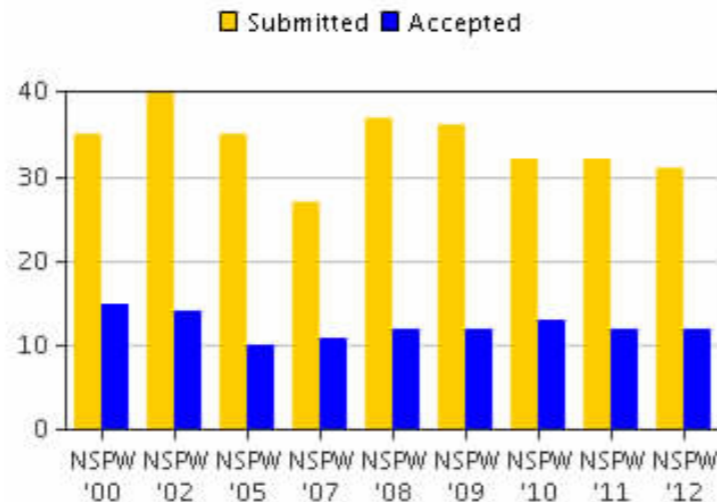
In-Cooperations ACM Assoc. for Computing Machinery
 CA Labs CA Labs
 Microsoft Microsoft

Publisher [ACM New York, NY, USA ©2012](#)
 ISBN: 978-1-4503-1794-8 doi>[10.1145/2413296.2413305](#)

Conference **NSPW** [New Security Paradigms and Workshop](#)




Paper Acceptance Rate 12 of 31 submissions, 39%
 Overall Acceptance Rate 111 of 305 submissions, 36%



Year	Submitted	Accepted	Rate
NSPW '00	35	15	43%
NSPW '02	40	14	35%
NSPW '05	35	10	29%
NSPW '07	27	11	41%
NSPW '08	37	12	32%
NSPW '09	36	12	33%
NSPW '10	32	13	41%
NSPW '11	32	12	38%
NSPW '12	31	12	39%
Overall	305	111	36%

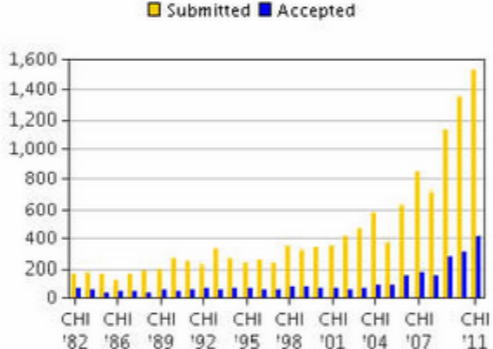
Acceptance Rate CHI

[Abstract](#)
[Authors](#)
[References](#)
[Cited By](#)
[Index Terms](#)
[Publication](#)
[Reviews](#)
[Comments](#)
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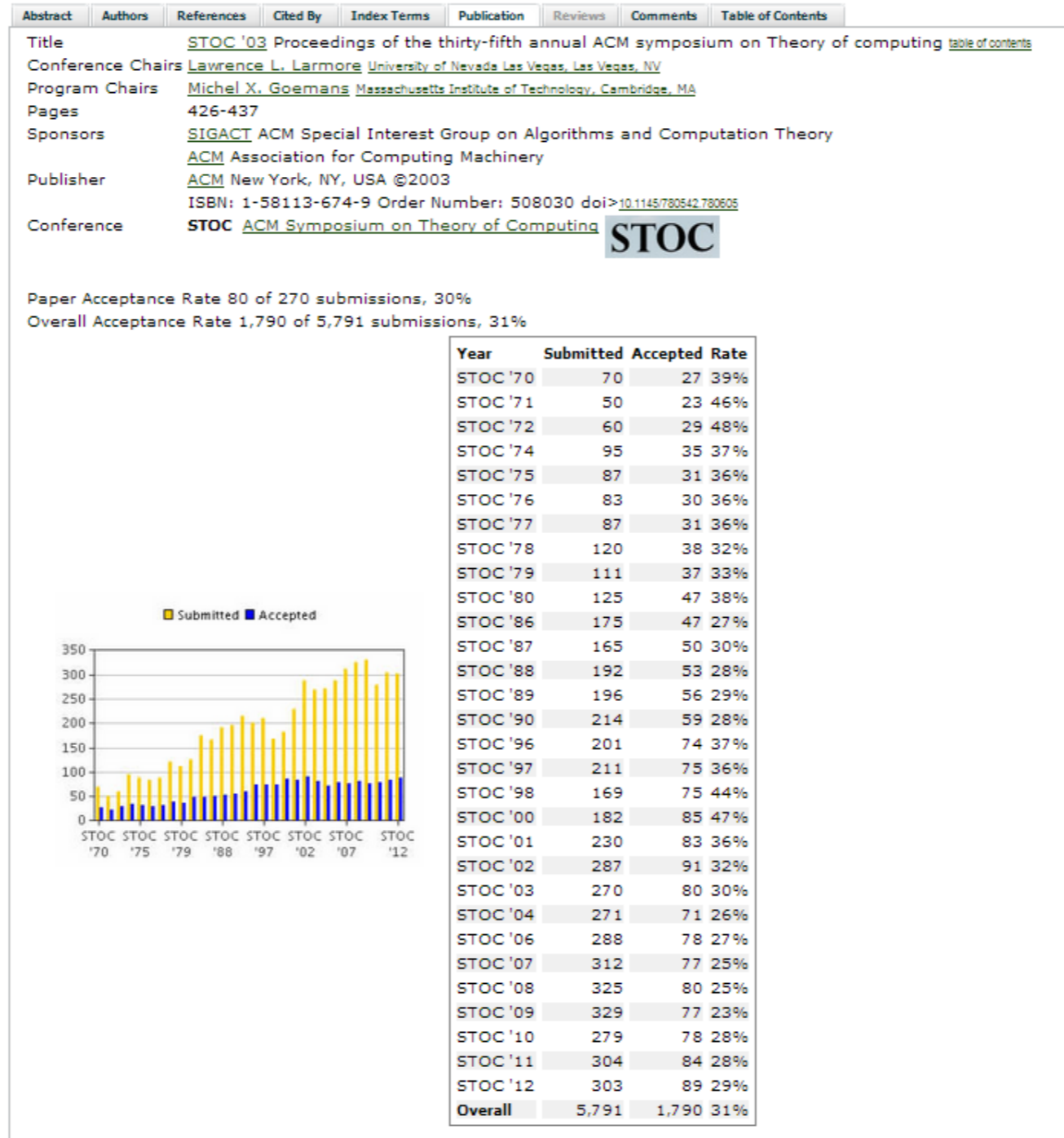
Title [CHI '12 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems](#) [table of contents](#)
General Chairs [Joseph A. Konstan](#) [University of Minnesota](#)
Program Chairs [Ed H. Chi](#) [Google](#)
[Kristina Höök](#) [Mobile Life at KTH](#)
Pages 579-588
Sponsor [SIGCHI](#) ACM Special Interest Group on Computer-Human Interaction
Publisher [ACM](#) New York, NY, USA ©2012
 ISBN: 978-1-4503-1015-4 Order Number: 609121 doi>[10.1145/2207676.2207758](#)
Conference [CHI](#) [Conference on Human Factors in Computing Systems](#)


Overall Acceptance Rate 2,934 of 12,583 submissions, 23%

Year	Submitted	Accepted	Rate
CHI '82	165	75	45%
CHI '83	176	59	34%
CHI '85	170	35	21%
CHI '86	122	47	39%
CHI '87	166	46	28%
CHI '88	187	39	21%
CHI '89	199	54	27%
CHI '90	260	47	18%
CHI '91	240	56	23%
CHI '92	216	67	31%
CHI '93	330	62	19%
CHI '94	263	70	27%
CHI '95	228	66	29%
CHI '96	256	55	21%
CHI '97	234	55	24%
CHI '98	351	81	23%
CHI '99	312	78	25%
CHI '00	336	72	21%
CHI '01	352	69	20%
CHI '02	414	61	15%
CHI '03	468	75	16%
CHI '04	578	93	16%
CHI '05	372	93	25%
CHI '06	626	151	24%
CHI '07	840	182	22%
CHI '08	714	157	22%
CHI '09	1130	277	25%
CHI '10	1346	302	22%
CHI '11	1532	410	27%
Overall	12,583	2,934	23%



Acceptance Rate STOC



Conferences Submission Process

- Reviews
 - Succinct (1/2 page)
 - Anonymous (usually)
 - Sometimes double-blind – authors anonymous
 - May need to redact certain phrases to maintain anonymity
 - Contains comments for program committee and comments for authors
 - Authors may or may not take comments into account before submitting final version for publication
 - However, problem with submission date extensions!

Conferences Submission Process

- Reviews
 - Usually include
 - Summary of paper (e.g. problem, results, conclusions)
 - Contribution made
 - Sometimes only interested in main contribution
 - Strengths and weaknesses
 - Areas for improvement
 - Other references which could be followed up
 - Maybe comments about readability, style, length
 - Decision - Strong/Weak Accept/Reject
- This is your one page paper review

Journal Submission Process

- In computer science not used so frequently
 - Mostly for major results and additional validation
- In computer science can submit conference proceedings to journal afterwards
- More elaborate review process
 - Paper assigned to associate editor who selects reviewers (usually two)
 - Usually more thorough reviews
 - Lengthier submission process (can take years)
 - May have several rounds of revisions

Hybrid Journal/Conference

- Submission process similar to conference but multiple opportunities to submit
 - Usually regular deadlines
 - Sometimes can submit at any time
- Conference style program committee reviews papers
- Outcome may be accept, reject, or resubmit to future issue
- Accepted papers published throughout year