Calude – a person with many talents

Hermann Maurer

Professor at Graz University of Technology and Chair of Informatics Section of Academia Europaea

> Presentation for Cris Calude Auckland, February 21, 2012



THE ACADEMY OF EUROPE





Academia Europaea is a European, non-governmental association whose members are top-notch scientists and scholars, mainly from Europe, who want to promote learning, education and research.

AE provides independent advice to various bodies, coordinates national activities, and tries to improve public understanding of issues in science, humanity and bio-medicine. M & Foundation Meeting, 5-6 September 1988 #m M & Cambridge-

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For more see History of AE on www.ae-info.org/ae/Acad_Main

Foundation Meeting Cambridge Sept. 1988

First Plenary Meeting 1989 with 627 members Today: Over 2200 members, including 47 European Nobel Laureats, 4 EuropeanTuring awardees, etc... and many other top researcher like Cris Calude

Headquarter on top floor of the Royal Institution, founded 1799 (picture 1837)

Second office: Knowlede Hub Wroclaw, Poland, opposite City Hall (Opened 2011,here with President Professor Lars Walloe)





Support office for server <u>www.ae-info.org</u> in Graz, Austria



Although I am exactly two months early:

Happy birthday, Cris!

My wish to you, Cris: All the best for your further personal and professional life



My wish for me, Cris:

We will hear lots about scientific achievements in areas Cris has worked in in the next days ... I want to show that Cris has also been involved in many other things using two examples:

(1) J.UCS
(2) You are wrong with probability only 10⁻⁵⁰

J.UCS – Journal of Universal Computer Science www.jucs.org

--- A peer- reviewed journal that appears at least 12 times yearly in electronic issues

--- It appears in printed form after a year is over

What is so special about J.UCS?

--- started in 1994 (!)

--- publishing and reading are free of charge , only printed versions have to be purchased at cost

--- 5 year impact factor 0.8

--- 700.000 downloades of full papers (after seeing title and abstract)

--- new functionalities

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Last volumes have over 3.000 pages

ucs	J.UCS	J.UC
Olume 15	Volume 15	Volume 15
2009	2009	2009
Part 1 of 3	Part 2 of 3	Part 3 of 3
Annual Print	Annual Print	Annual Print
Archive Edition	Archive Edition	Archive Edition

Why I am telling you about J.UCS? Because it started with ideas of Cris, when I kept bugging him with the advantages of a new SW system ,,Hyperwave" my group in Graz had developed.

To understand, briefly look at early attempts trying to offer activities via the internet.

Major activites to use internet beyond email started all in the same year!

First Gopher Server (Minnesota: Mark McCahill): 1991 First WWW Server (CERN: B. Lee, R. Cailliau): 1991 First Hyperwave Server (Graz: Kappe, Maurer): 1991

Of the above, WWW was the most rudimentary one, originally only intended for one area (physics) and no interactivity, only dissemination.

Gopher had much better structure, more functionality.

Hyerwave was by far the most powerful... but also required most effort to install and learn how to use it.

In 1993, Gopher was most widespread all over the world (80.000 servers), WWW and Hyperwave had below 100 each.

Breakthrough of WWW due to the first graphic browser Mosaic in 1993, and because it was very easy to use.

Berners Lee leaves Europe for MIT and takes WWW with him. Some would say: He petrayed his friends at CERN (Robert Cailliau) and Europe.

Foundation of W3C: October 1994

WWW boom starts in 1994. Berners Lee enjoys being called the inventor of WWW (although it was a team of 4, he was just the alphabetically first one). He never acknowledges the main leader Robert Cailliau. With team of laywers he minimizes role of Europe.

Gopher disappears. Hyperwave survives in Intranets and some applications. How come Hyperwave has survived?

Hyperwave as multi-window system, capable of handling 3 D images and tracing moving objects



Some Features of Hyperwave

--- Avoids broken links

- --- Introduces structure in addition to links
- --- Stores information about information
- --- Introduces powerful access right system
- --- Breaks the ,,dictatorship of the webmaster"
- --- Introduces automatic version control
- --- Supports multi-linguality
- --- Provides flexible search
- --- Allows annotations to everything
- --- Provides basis for workflow and compliance

Some Features of Hyperwave Avoids broken links:

Automatic link management possible using --- bidirectional links --- link info kept separate from document

Thus, if document pointed to is moved, all links pointing to it are adjusted; if document is removed, all links pointing to it are removed (made invisible) Some Features of Hyperwave Introduces structure in addition to links

Why? Because large WWW servers using links only create ,,huge spaghetti bowl" that is VERY difficult to maintain!



(Quote from: Robert Cailliau, co- developer of the original WWW, CERN)

Note: All parts on yellow background (like the one above) are actually taken from slides some 15 years old!)

Some Features of Hyperwave

In designing Hyperwave, some basic lessons learnt from programming and data bases were incorporated, but ignored by the non-computer science group at CERN.



Some Features of Hyperwave Introduces structure in addition to links



Advantages: Intuitive easier to understand, many link maintenance difficulties just disappear. Feeling of directories! Main Features of Hyperwave Introduces powerful access right system Breaks the "dictatorship of the webmaster"



Hierarchical user rights administration



Different views for different people

Main Features of Hyperwave



"Black" and "red" have entirely different views of same data universe due to different access rights for folders, documents and links (!) Some Features of Hyperwave Provides flexible search Allows annotations to everthing

Search as you would expect now, including search on metadata and links

Annotations to any object possible, and annotations to them, etc., etc. Today we would say: "A blog can be attached to any object" Some of the things I told Cris tickled him. Finally he said. ,,If the system is as good as you claim, why don't we build an electronic journal on top of it? I have some ideas for it :"

Cris: "A contribution once published cannot be changed, but anyone Can comment it. You said this is built into Hyperwave, and the original author is notified automatically?" I: "Yes"

Cris:,,We can build a new refereeing system involving all members of editorial board to speed up publication?" I: "Yes"

Cris: "Using the bidirectional link structure, could Hyperwave not automatically support Links into the Future?" I: "Yes"

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So we started implementation of J.UCS end of 1993, went online 1994. And ever since, J.UCS has been running on a Hyperwave server : www.jucs.org

www.jucs.org:



J.UCS is run by the <u>J.UCS consortium</u> consisting of the following research institutions (in alphabetical order):

- Austrian Competence Center for Knowledge Management, Graz, Austria
- Faculty of Informatics, University of Passau, Germany
- Galileo University, Guatemala City, Guatemala
- Graz University of Technology, Graz, Austria
- Institute for Information Systems, RWTH Aachen University, Aachen Germany
- L3S Research Center Hannover, Hannover, Germany
- Mohammad Ali Jinnah University, Islamabad, Pakistan
- National University, San Diego, USA
- Universiti Malaysia Sarawak, Kuching, Malaysia

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Unique Features of J.UCS

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Unique features of J.UCS

J.UCS Journal of Universal Computer Science

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CSCWD: New Applications and Challenges	M.R.S. Borges, J.A. Pino, W. Shen	1884
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Volume 2 / Issue 3



Government, Cryptography, and the Right to Privacy

Jenny Shearer (HyperMedia Unit, University of Auckland, New Zealand)

Peter Gutmann (Computer Science Department, University of Auckland, New Zealand)

Abstract: The notion of a right to privacy of citizens in their communications is discussed in the context of an international movement by governments towards regulation of cryptography, and consideration of key forfeiture systems in national cryptography use. The authors argue that the right to privacy in communications networks is an issue of major importance, assuring freedom of the individual in national and global communications. Regulation and control of cryptography use on the Internet by national governments may lead to an imbalance in the citizen/government power relationship, with sequelae including unprecedented surveillance of citizens, disruption of international commerce due to lack of powerful cryptography (and lack of standardisation), human rights abuses by less democratic or non-democratic governments, and limiting of the political potential of an Internet global political system.

J.UCS Journal of Universal Computer Science

Government, Cryptography, and the Right to Privacy Vol. 2 Issue 3 Publication date: 1996-03-28

written by Jenny Shearer () Peter Gutmann (pgut01@cs.auckland.ac.nz)	
Links into the Future	Experts associated with the topics of the paper
This feature identifies the most relevant papers for the current paper from the J.UCS database. More information can be found <u>here</u> .	This feature identifies experts (members of the J.UCS editorial board and authors of articles published in J.UCS) for the topics of the current paper. More information can be found <u>here</u> . Click the name to access FacetedDBLP.
1. Jenny Shearer, One Net One World Global Citizenship and the Internet in: <u>Vol. 2 Issue 12</u> Page: 842 - 857	This paper belongs to the topics listed below. Related papers and assigned editors for the topics of the paper can be found by following any of the links: <u>E.3: DATA ENCRYPTION, K.4.2: Social Issues, K.5.2: Governmental Issues</u> ,
2. Hermann Maurer, Jenny Shearer, Is Democracy Possible in the Internet? in: Vol. 8 Issue 3 Page: 396 - 407	Active research areas in J.UCS related to the topics of the paper and the top 10 ranked experts are shown below:
	E.3: DATA ENCRYPTION: Yang-Sun Lee, Seokhie Hong, Jongsung Kim, Changhoon Lee, Mufutau Akinwande, Jeong+Ok Kwon, Ik+Rae Jeong, Oscar Pérez, Yves Berviller, Camel Tanougast,
	<u>K.4.2: Social Issues:</u> Lourenço Basso, Lucila+Maria Santarosa, Andreas+U. Schmidt, Ian+H. Witten, Zbigniew Hulicki, Anne Baumgraß, Benedikt Meuthrath, Claudia Müller, Wolf-Tilo Balke, Narayanan Kulathuramaiyer,
	<u>K.5.2: Governmental Issues:</u> Narayanan Kulathuramaiyer, Wolf-Tilo Balke, Gio Wiederhold,

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Volume 2 / Issue 3



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Categories: E.3, K.4.2, K.5.2

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J. Shearer, H. Maurer. cs Is Democracy Possible in the Internet? Concepts of democracy have been developed and refined since A set of circumstances, social, technical, and economic, have enab- In: Vol. 8 / Issue 3 page 396 - 407	ristotle's time. However it is not until the new millennium that a unique oled a realistic plan of an e-democratic world to
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Volume 9/ Issue 4



The Future of PCs and Implications on Society

Hermann Maurer (Graz University of Technology, Austria)

Ron Oliver (Edith Cowan University, Australia)

Abstract: In this paper we argue that in about ten years time PCs as we now know them, will no longer exist. Their functionality will be totally integrated into mobile telephony devices, or putting it differently, in ten years time mobile phones will incorporate all functions one would expect from a powerful PC. These new devices, let us call them eAssistants, will be with us all the time and will change our lives enormously. In this paper we take a first look at both the technological and applied aspects of this prediction.

Keywords: display technology, future computers, societal implications, wearable PC

Annotations



Comments on (H. Maurer, R. Oliver) The Future of PCs and Implications on Society

Copyright-Anfrage 2012/01/26

Sehr geehrte Herren, Ihre Arbeiten sind excellent! Ich möchte in einem Artikel über "Mobile Learning" darauf Bezug nehmen und insbesondere zur Illustration Ihr Bild "figure 1" verwenden, selbstverständlich mit Quellenangabe und Copyright-Vermerk. Der zweiseitige Artikel soll im "DGUV-Forum" erscheinen, eine Zeitschrift der Deutschen Gesetzlichen Unfallversicherung (DGUV), die u.a. auch populärwissenschaftliche Berichte zu Arbeitsschutz-Projekten veröffentlicht. Anlass ist ein staatlich gefördertes Projekt "Mobile Learning für Berufskraftfahrer im Fernverkehr", in Zusammenarbeit mit der Fernuniversität Hagen, Lehrstuhl Claudia de Witt. Absicht meines Artikels ist, den Lesern (Arbeitsschützer, Arbeitswissenschaftler) zu zeigen, dass Lernen sich in den nächsten Jahren radikal verändern wird und der e-Assistant darüberhinaus die Möglichkeit bietet, Arbeitsschutz direkt vor Ort und direkt im Prozess zu gewährleisten. Deshalb wäre ich Ihnen sehr dankbar, wenn Sie der Verwendung Ihrer Zeichnung zustimmen würden. Selbstverständlich würde ich Ihnen ein Exemplar der Veröffentlichung zusenden. Mit freundlichen Grüßen Michael Peters Bereichsleiter Lernen und elektronische Medien IAG - Institut für Arbeit und Gesundheit der Deutschen Gesetzlichen Unfallversicherung e.V. Königsbrücker Landstraße 2 D-01109 Dresden <mailto:Michael.Peters@dguv.de> Tel.: +49 351 457 -1922 Fax: +49 351 457 -201922 IAG-Seminare im Internet < < http://www.dguv.de/iag-seminare>> Informationen: < http://www.dguv.de/iag>>



Refereeing system

The abstract of each paper is sent to all members of the Editorial Board (preferrable in the area of the paper, to avoid overload)

Editorial Board: ~ 350 members, qualifications well defined (Basically: Tenured associate professor or above, And solid pulication record in good journals)



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Various geographical ,,mash-ups" are availble in JUCS:

More specifially:

--- see where editors in some area are located
(important for both administrators and submitters of papers)
--- see where papers come from (in particular year and scientific area, for both administrators and submitters)
--- see where referees for a particular paper come from (for editor in chief only, to avoid cronyism)

J.UCS Journal of Universal Computer Science



at jucs feedback@iicm.edu, Thank you!







With the refereeing system of J.UCS a problem remains: What if author asks three friends to review paper favorably?

- We need a function f that, given two persons A and B, gives f(A, B) = g with $0 \le g \le 1$ as a ,,guessed" probability that A and B are friends
- Interesting problem! Algorithm uses: co-location, past co-location, co-authorship, joint committee work, social networks, etc. etc. to arrive at educated guess. If g > 0.75 we choose different referee.
- Also interesting but still more difficult: estimate if A and B are enemies! (E.g. co-located but never on same committee, sentiment analysis of reviews of A of papers of B gives negative score, etc.)

Although there is more to J.UCS than this, I guess it is enough for today. Let me give some final facts.

J.UCS is going strong...papers are downloaded 3.000 times on average!

J.UCS is now run by a consortium of 9 organisations. I stepped down as Managing Editor-in-Chief January 2012 in favour of Christian Guetl, from my institute in Graz. J.UCS has now over 300 members of the editorial board, but could need another 200. If interested, tenured associate professor or above and with good publication record, please do join!

A completely new submission system will be opened before mid-year

I said at the beginning:

We will hear lots about scientific achievements in areas Cris has worked in in the next days ... I want to show that Cris has also been involved in many other things using two examples:

(1) J.UCS
(2) You are wrong with probability only 10

So, what does the mysterious point (2) mean?

Paul Gillard (Memorial University, New Foundland) and I wanted to write a program that would allow students to practize differentiation of functions.

Basic idea is clear. We would generate functions of a complexity depending on what they had learnt so far.

Given such an f(x) students would compute derivative g(x) and computer would also compute derivative h(x).

It remained to check if $g(x) \equiv h(x)$, i.e. the identify of g(x) and h(x)

However, this has been known to be undecidable since 1968!

The undecidability of this problem (to find out if two functions g and h are identical) has held back this and many other efforts for decades!

Paul and I decided to examine if g(x)=h(x) at 100 random points. And if so, we would grade student answers as correct... risking a (very) small percentag of error:

Of course it can be that g(x)=h(x) at 100 hundred random values for x, but still for some y $g(y) \neq h(y)$.

Paul and I thought it highly unlikely, but could not put a probability to it. It was Cris who showed: Under mild assumptions, the likelyhood that g and h are not identical if they agree on 100 random values, is less than 10^{-50} Since then, I sleep well. I know that for all practical purposes we have solved an unsolvable problem.

Thanks, Cris for helping us with this result. Thanks for believing we can do something nice with J.UCS, and for helping to find the first 150 editors. And, most of all , thanks for your friendship.

Again, best wishes to Cris, and thanks to all who made my visit here possible!

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