Draft Minutes of IFIP TC1 Meeting 2005

Time and Date: 10:00 – 16:30, June 30, 2005

Place: SEO Room 1000, University of Illinois at Chicago
Morgan Street, Chicago, IL, USA

{We would like to express our sincere appreciation to Professor U. Buy f University of Illinois at Chicago, who kindly arranged the meeting room for our TC1 meeting.}

(I) **TCS Colloquium** (10:00 – 12:50)

① "An overview of the rewriting calculus"
by C. Kirchner (WG1.6 Chair and Professor of INRIA & LORIA)

② "Some (future) practical applications of Theoretical Computer Science"
by M. Hinchey (TC1 Chair-elect and Director of NASA Software Lab)

③ "Automatic generation of control supervisors for discrete manufacturing plants"
by U. Buy (Professor of University of Illinois at Chicago)

<<Lunch Break>> (13:00 – 14:30)

(II) **Business Meeting** (14:30 – 17:00)

[1] <Attendees>

T. Ito (JP; Chair); J. Baeten (NL);
M. Hinchey (US-IEEE); C. Kirchner (WG1.6 Chair)

<Apologies>

W. Brauer (DE);	E. Mayr (DE);	R. Baeza-Yates (CL & CLEI);
Z. Esik (HU);	G. Ausiello (IT);	A. Bertoni (IT);
U. Montanari (IT);	D. Johnson (US-ACM);	J. C. Mitchell (US-ACM);
J. Traub (US-ACM);	J. Diaz (ES);	N. Santoro (CA);
J. Blazewicz (PL);	A. Tarlecki (PL);	H. Lin (CN);
U. Nestmann (CH);	M. Nielsen (DK);	J. Sakarovitch (FR);
P. van Emde Boas (NL);	G. Rozenberg (NL);	D. Sannella (GB);
I. Simon (BR);	P.D. Eades (AU);	P. Spirakis (GR);
H. Wozniakowski (WG1.1);	C. Kintala (WG1.2);	J.L. Fiadeiro (WG1.3);
R. Gorrieri (WG1.7);	N. Kobayashi (JP)	

[2] TC1 Meetings in 2005

TC1 Email Meeting: February 1st – 10th, 2005

TC1 Meeting at Chicago: June 30th, 2005

[3] Membership Issues

There have been two issues on TC1 membership:

* Election of the next TC1 Chair for the term 2006–2008
* Appointment of the TC1 Vice Chair.

(3.1) Election of the next TC1 Chair for the term 2006–2008

* As was reported in the Chairman ' s Report for the IFIP Council in Korea, the current TC1 Chair finishes his term at the end of 2005, so that he asked TC1 members to form " Panel for Election the Next TC1 Chair ", mentioning that he has no intention of " re-elected ". At the TC1 Email meeting held early February the TC1 Chair proposed some basic procedures for the election and Panel formed by the following members:

  W. Brauer (Panel Chair), D.S. Johnson, I. Simon, G. Ausiello, T. Ito

  This proposal of forming the Panel was approved, together with the basic procedures for the election.

* The Panel Chair sent Call for Nomination to all TC1 members (including WG Chairs). Also, the Panel discussed about some possible candidates for the next TC1 Chair, and the Panel Chair and members had contact with possible candidates -- more than five TC1 members-- mentioned during the discussions in the Panel; however, none of them accepted proposal of the Panel to nominate him as a candidacy for the election.

  Mike Hinchey (US-IEEE) was proposed from the outside of the Panel while the discussions in the Panel were going on.

  After some discussions the Panel decided to held the election with a single candidate, Mike Hinchey.

* Election and its result

  The election was held under the leadership of the Panel Chair, and its voting was conducted by the Head of the IFIP Secretariat. The election result is as follows:

- Persons with voting rights:	51	
- Received votes:	32	(62.7 %)
- Valid votes:	31	(60.8 %)
- Not valid:	1	
Out of valid votes:		
- for Mike Hinchey:	31	(100 %)
- against:	0	
- abstain:	0	

Thus, Mike Hinchey has been elected as the next TC1 Chair for 2006–2008.

The above result was also confirmed at the TC1 meeting in Chicago. We are pleased

to have Mike Hinchey as the next TC1 Chair.

(3.2) Appointment of the TC1 Vice Chair

After the election of the next TC1 Chair, the current TC1 Chair has proposed appointing Mike Hinchey (the TC1 Chair-elect). This proposal was approved within the TC1 and was confirmed at the TC1 meeting in Chicago.

Mike Hinchey will be appointed as the Vice Chair on July 1st until the end of 2005.

[Roles of TC1 Vice Chair]

* attend IFIP meetings (like GA, Council, TA) on behalf of the TC1 and its Chair.
* help the TC1 Chair, making advices on various issues.
* make suggestions/proposals on whatever he think important and necessary for TC1.

[4] TC1 Funds for 2006

The TC1 Chair mentioned his expectation of the TC1 budget for 2006 as follows:

a. Royalities	250 euro
b. Event proceeds	0 euro
c. Other incomes	0 euro
d. Operating expenses	3,000 euro
e. Activity expenses	3,800 euro
(for IFIP School by WG1.6: 1,500 euro)	
(for Workshop by WB1.3: 1,000 euro)	
(for LATIN 2006: 1,300 euro)	
f. Result (a+b+c+d-e)	-550 euro
g. Fund balance (2,999 euro * 0.8 -550)	1,849 euro
(2,999 euro is the fund balance for 2005)	
h. Fund to be used in 2006	3.800 euro

Activities expenses had been approved by emails in TC1.

The above expectation has been mailed to the IFIP Treasurer.

If things proceed as before, the TC1 Chair will get more definite information on TC1 funds for 2006 from the IFIP Treasure by the end of July.

The TC1 meeting in Chicago has approved the above report with understanding on some procedural issues for the IFIP budget.

[5] Issues on Working Groups

(5.1) No specific report for the TC1 meeting in Chicago meeting from WG Chairs except two proposals concerning TC1 funds, as mentioned above.

(5.2) Creation of WG1.8 on Concurrency Theory

Creation of WG1.8 on Concurrency Theory was decided at the last TC1 meeting in Toulouse, as is reported in the Chairman's Report for the IFIP Council

in Korea. The current TC1 Chair wrote a proposal for creation of WG1.8, which was formally submitted to the TA held at Toulouse. The proposal was well accepted at the TA. But the Chair of TC10 mentioned that he needs to consult within TC10 to see if there is any significant overlap between their WG10.3 on Concurrent Systems and our proposal of WG1.8 on Concurrency Theory. So, the final TA decision of creating WG1.8 on Concurrency Theory has been postponed. Moreover, Luca Aceto (who is a person asked at the TC1 meeting at Toulouse to write the proposal on Concurrency Theory, but he didn't write it for the TA held at Toulouse) has created some additional problems because of some misunderstandings. Also, he wrote "something" to the IFIP President according to a mail from the IFIP President to the TC1 Chair.

Since TC1 has decided creation of WG1.8 on Concurrency Theory it is better to proceed further to get approval of the TA for creating WG1.8.

In order to prevent any further delay the Chair has asked Jos Baeten (who is a member of the group that worked for proposal of Process Algebra) to contact Luca Aceto to proceed to the next step to get approval at the forthcoming Technical Assembly to be held early September. Jos Baeten has agreed to contact Luca Aceto for completion of the proposal, attaching "Challenging Problems in Concurrent Theory" and a list of WG members with their short biographies. Also, the Chair submitted a document "Some Challenging Topics in Concurrency Theory" which can be used to explain challenging issues of WG1.8.

BTW, the document and the proposal on WG1.8 submitted for the TA at Toulouse are attached to this Minutes (since both were submitted to the TC1 meeting at Chicago).

[Remarks-A] <Past stories>

* A proposal of creating a WG on Process Algebra was submitted to the TC1 Chair in December, 2003.
* The TC1 Chair made several comments for improvements of the proposal so as to include (a) more non-European researchers as WG members (suggesting several names) and (b) several Grand Challenges for the WG's activities.
* There were at least two strong negative comments on the revised version of WG on Algebraic Process Calculi in June--July, 2004.

  In July, 2004 the TC1 Chair had suggested, to Luca Aceto, changing the name of WG to Concurrency Theory or Process Calculi so as to cover broader topics than "Algebraic Process Calculi".
* At the TC1 meeting in Toulouse there were strong negative comments on a

proposal of WG on Algebraic Process Calculi, which was proposed by Luca Aceto (with no document circulated/distributed at the meeting).

* However, there were expressed some strong interests of organizing WG on Concurrency Theory
* Taking into account the comments, the TC1 Chair proposed to establish WG on Concurrency Theory, and he asked Luca Aceto to write a proposal on WG on Concurrency Theory. Also, there were expressed some opinions and wishes to create the WG as early as possible.

  Taking into account those opinions and wishes the Chair proposed WG1.8 on Concurrency Theory at the TA in Toulouse, writing a proposal of WG1.8 on Concurrency Theory by himself, since Luca Aceto returned home without providing any collaboration in writing the proposal.
* A proposal on WG1.8 on Concurrency Theory (written by the TC1 Chair) was formally submitted to the TA at Toulouse. It was well accepted at the TA, but the TC10 Chair mentioned that he needs to consult with TC10 members (because TC10 has WG10.3 on Concurrent Systems). The TA Chair has decided to postpone the decision on creation of the WG1.8.
* After September, 2004 some confusions have occurred between the TC1 Chair and Luca Aceto.

  What are the origins of the confusions?

  > The TC1 Chair thinks that WG1.8 proposal on Concurrency Theory has been created, reflecting lots of comments by attendees at the TC1 meeting at Toulouse.

    There are big differences between the original WG proposal on Process Algebra (written by Luca Aceto and his colleagues) and the proposal on WG1.8 on Concurrency Theory (written by the TC1 Chair in August, 2004).

  > For Luca Aceto it seems that everything on the WG1.8 proposal has been done by him and his colleagues, so that he has sent his documents directly to the IFIP President (and the TA Chair) late 2004 without mentioning efforts of the TC1 Chair.

  > Some important technical issues on Concurrency Theory are not described yet, even in the documents that he sent to the IFIP President, so that the TC1 Chair prepared a short abstract of "Some Challenging Topics of Concurrency Theory" for the TC1 meeting at Chicago, which is an English abstract of his talk given at a domestic meeting in Japan; it is attached below together with the proposal of WG1.8.

> At the TC1 meeting (Chicago) we have re-confirmed creation of WG1.8 on Concurrency Theory so as to seek its approval at the forthcoming TA in September, 2005.
The TC1 Chair has asked Jos Baeten (who is a member of the group that worked to write a proposal of WG on Process Algebra) to collaborate for creation of the WG, contacting Luca Aceto and his colleagues.

[Remarks-B]

> Since the proposal of WG1.8 on Concurrency Theory has been formally submitted to the TA in Toulouse, it is better to keep it unchanged for a quick processing at the TA. A change on the proposal may cause another delay, when some TC chairs say need of consultation with their TCs.

> It is necessary to check if Luca Aceto is still willing to be Chair of WG1.8 on Concurrency Theory. This will be done by Jos Baeten.

> A formal proposal of creating a new WG should be written by a person who is supposed (or, proposed) to become its WG Chair.
From such a standpoint the treatment of WG1.8 is quite unusual. This unusual style should not be repeated again.

(5.3) Re-establishing WG1.5.

* WG1.5 on Cellular Automata and Machines was dis-solved at the TA in Cape Town in March, 2004 because of internal fight within the WG members.

* What happened in WG1.5?

[In Autumn, 2003]

A group of WG1.5 (say, Group-A) mailed to the TC1 Chair a new proposal of Discrete System Modeling based on cellular automata, saying that the WG1.5 Chair (at that time) terminated his term so that they decided to re-organize the WG1.5 finding a new WG1.5 Chair (say, KKKKK). Another group of WG1.5 (say, Group-B) mailed to the TC1 Chair about their result of electing a new WG1.5 Chair (say, MMMMM).

The TC1 Chair asked the WG1.5 Chair (at that time) to resolve the conflicting affairs in WG1.5. But he said that he lost his interest in cellular automata and he is busy in various commitments in establishing a new university. After getting more information on the affairs the TC1 Chair found difficulty in resolving the issues of WG1.5, so that he decided to propose dis-solving WG1.5 at the TA meeting in Cape Town. However, he encouraged both groups to work together to re-establish WG1.5.

* Early this May two persons [T. Worsch (DE), R. Vollmar (DE)] in Group-B has

mailed a new proposal to re-establish WG1.5. The proposal was to combine "cellular automata" and "discrete system modeling" in its title but not in its technical content and its membership. The number of members related to Group-B has been increased more than three times, while the number of members related to Group-A has been decreased less than half of the members of the proposal of Group-A.

* A key person of Group-A is B. Durand (FR), and a key person of Group-B is T. Worsch (DE). B. Durand was WG1.5 Secretary when R. Vollmar (DE) was the WG1.5 Chair, and T. Worsch (the successor of B. Durand) was WG1.5 Secretary when the WG1.5 Chair was G. Mauri.

  The person elected by Group-A as a new WG1.5 Chair was S. Kari (FI), and the person elected by Group-B as a new WG1.5 Chair was K. Morita (JP).

* Taking into account the above circumstances, the TC1 Chair has proposed to re-establish WG1.5, having the following structure:

  Chair: R. Vollmar (DE)

  Vice Chair: S. Kari (FI), K. Morita (JP)

  Other WG1.5 Members: Members that appears in IFIP Bulletin 2004.

  SIG on Foundations of Cellular Automata,
  chaired by T. Worsch (DE)

  SIG on Discrete Systems Modeling and Cellular Automata,
  chaired by B. Durand (FR).

[Remark] After re-establishing WG1.5, its Chair (R. Vollmar) should conduct the WG to form a friendly one, and he should conduct an election of a new WG1.5 Chair within two years.

[6] On Collaboration to WCC2006 in Chile

The next WCC (IFIP World Computer Congress) will be held in Santiago, Chile in August, 2006. All TCs have been asked collaboration to WCC2006.

At the TC1 meeting in Toulouse we discussed if we organize TCS2006 within WCC2006. However, there was no support for organizing TCS2006 within WCC2006, as is recorded in the Minutes of the Toulouse meeting.

The TC1 Chair thinks that it would be important to provide collaboration to WCC2006, so that he has asked TC1 Members to propose some workshops to be held at WCC2006. If we can organize several workshops on TCs we would be able to organize a theory track by a series of workshops. As is mentioned in Chairman's Report for the Council in Korea the Chair had contact with R. Baeza-Yates, since he is only a TC1 member from Chile.

So far, there is no proposal from any TC1 member yet.

The TC1 Chair will continue more efforts to seek possibility of organizing workshops at WCC2006, getting collaboration of M. Hinchey (the newly appointed Vice Chair), WG Chairs and TC1 Members.

[7] On "A proposal of Revising and Updating IFIP Bylaws Concerning TC Membership"

Since the current TC1 Chair was appointed on January 1st, 2003, he expressed his personal opinions and views to make IFIP and its Congress more active and attractive at the occasions of the TA meetings; he thinks that IFIP and WCC Congress were more attractive and interesting for young computer scientists in 1960s - 1980s, and we need to something to revive IFIP. Taking into account of some positive reactions from several TC chairs, he submitted his personal proposal of revising IFIP Bylaws and of introducing an IFIP Fellow system to identify those who made clear technical contributions to IFIP.

At the TC1 meeting in Chicago the proposal was circulated as an input document. This proposal may be discussed within TC1.

[8] Next Meeting

A next Email meeting will be held in October to report some important issues mentioned above and to discuss the membership issues for 2005.

A next TC1 meeting (its date & place) will be decided under the leadership of the next TC1 Chair, M. Hinchey.

Proposal of Creating WG1.8 on Concurrency Theory

WG1.8 on Concurrency Theory

AIMS

- To develop theoretical foundations of concurrency, exploring frontiers of existing theoretical models like process algebra and various process calculi, so as to obtain a deeper theoretical understanding of concurrent and parallel systems.
- To promote and coordinate the exchange of information on concurrency theory, exchanging ideas, discussing open problems, and identifying future directions of research in the area.

SCOPE

The activities of this WG will encompass all aspects of concurrency theory and its applications. The themes of the WG include:

- process algebra and calculi
- expressiveness of formalisms for concurrency
- modal and temporal logics for concurrency and their extensions
- resourse sensitive approach for concurrency and its developments
- tools for verification and validation of concurrent systems
- reactive models for real-time and hybrid systems
- calculi and typing systems for mobile processes and global computing
- stochastic and probabilistic models of concurrent processes
- decidability and complexity issues in concurrency theory
- semantic frameworks for concurrency such as structural operational semantics
- integration of concurrency concepts into programming languages and (global) concurrent systems
- exploration of frontiers of concurrency theory in connections to various branches of computer science, including theories of operating systems, internet languages, Petri nets and their applications, communication protocols, security issues in internet, global ubiquitous computing, distributed algorithms, embedded systems, software architectures and engineering, automata theory, information theory, various formal methods, control theory and robotics, bio-computing, quantum computing, and other emerging areas.

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Some Challenging Topics in Concurrency Theory

Takayasu Ito

There have been a number of challenging topics in concurrency theory since the notion of concurrency was created in theoretical studies of concurrent processes in operating systems and parallel computations.

Current flourishing theoretical studies on concurrency are based on two distinct approaches:

* One is based on message-passing models that stem from Hoare's CSP and Milner's CCS and π-calculus.
* Another is based on logical approaches that are notably represented by temporal

logic descriptions initiated by Burstall and Pnueli and linear logic descriptions invented by Girard.

Both approaches have been developed in the framework of Plotkin's style of describing operational semantics called SOS (Structured Operational Semantics) inspired by the Gentzen's Sequent Calculus.

Besides these approaches there are a number of studies on concurrency like Petri nets, automata-theoretic approaches, language-theoretic approaches (like shuffle and/or concurrency expressions).

Also, from the standpoint of parallel algorithms and complexity theory a number of models have been proposed.

Current theoretical studies on concurrency have been directed towards comprising all these approaches on the bases of message-passing models and logical approaches with big influences of the latest technological progresses like "internet and web computing", "security issues", "cluster computing and massively parallel computing", "bio-computing and molecular computing".

In this note we describe a number of challenging topics in concurrency theory.

[1] Establishing theoretical foundations of provably correct and reliable operating systems

{This has been a great challenging theme in concurrency theory since 1960s, but almost no one has ever challenged in a straightforward way because of its difficulty.}

[2] Establishing logical frameworks of concurrency with mechanisms of recovery from deadlock and starvation and of detecting malfunction in concurrent systems

[3] Bridging concurrency theory and parallel computation so as to establish a sound and efficient parallel computing framework from both of semantical and algorithmic standpoints

These three have been challenging yet fundamental issues in concurrency theory since early 1970s.

Reflecting the latest developments in computers and networks there have been a number of challenging themes, some of which are subsidiary topics of the above three major themes.

[a] Process calculi that guarantees "safety and security" and "trustiness" of processes and their actions

{Spi calculus by Abadi and Gordon is an example.}

[b] Process calculi with ability of expressing mobility, temporality, resource

sensitiveness, cost-sensitiveness, and locality.

[c] Process calculi with trustiness of information as theoretical bases of mobile processes in global networks.

[d] Theoretical foundations of verifying compilers for concurrent and distributed languages.

[e] Theoretical foundations of efficient concurrent and parallel computing for irregular applications.

[f] Theories of powerful parallel control mechanisms and structures and their applications in hardware design and parallel language design

[g] Design and implementation of theory-based languages and systems and theory-based tools for design and implementation.

[h] Emerging applications

1. Industrial applications
2. Socio-Economic applications
3. Biological applications