What Next For CiE?

Background

Computability in Europe (CiE) was formed in the Spring of 2003, originally as a vehicle for seeking EU funding. Its initial impetus came from researchers in mathematics and computing with a background in logic and computability theory. Since then, CiE has grown rapidly. It soon seemed, as the introduction to the LNCS proceedings volume for CiE 2005 puts it: “If CiE did not exist [already], it would be necessary to invent it.” Many of us came to see the broader benefits our research community could derive from being more organised.

The Scientific Basis for CiE

With hindsight, one can trace the scientific constituency of CiE back to Alan Turing’s work in logic, mathematics and early computing. And almost immediately after 1936 one can see at work the forces for fragmentation of the the research community he gave birth to. Within mathematics most computability research came under the heading of ‘recursion theory’ or ‘proof theory’, two of the four main components of mathematical logic. Many computer science departments originated as parts of mathematics departments. But there was an inevitable drive towards an engineering perspective, and a corresponding structural separation between computational practice, and the logic which continued to play an important part in the development of the computer and programming techniques.

There are now many people on both sides of this divide who carry forward the Turing tradition of fundamental research related to real-world computational problems. The need to transcend on the one hand traditional logical boundaries, and on the other pressures towards immediate applications and the narrowly ad hoc, has given rise to a whole community of researchers who often have more in common with each other than with their immediate academic colleagues. CiE gives a visible expression to that community, while helping it address the immediate needs for greater interaction, appropriate funding, and the reconciliation of differing academic cultures.

The European Dimension

European researchers, particularly those with a logical background, have played a seminal role in the development of computing and its conceptual context. This contribution continues to be strong. European computer science excels in basic research, and younger researchers especially move easily between theoretical and applied contexts. However, past national divisions still exert a residual negative effect. The net migration of leading researchers to North America continues, while many of its earlier causes (social upheavals, economic problems) have largely disappeared. There is a historically-based cycle of factors at work, and a related element of under-achievement in many areas of European science.

The lack of European cohesion has meant that many international organisations (learned societies, conference series) have grown up within the more favourable North American context, and many European researchers look first to America for research collaborations and benchmarks for aca-

demic excellence. International links beyond Europe will always be very important to us, but a strong European research community is a prerequisite for a more equal relationship. A Europe where scientifically 'all roads lead to the coast' can have no place in the 21st century. CiE 2005 is just a first example of the exciting prospects for European cohesion within our small but important area of research.

The CiE Conference Series

CiE 2005 grew out of the recognition that the wider visibility of our research community could be one prerequisite for being seen by the EU as being worth funding. The success of this first conference has been beyond our most optimistic expectations, and has shown its value in this and a number of other ways.

The recent EU Call for proposals for Marie Curie Conferences and Training Courses pushed CiE to agree to a series of annual conferences, extending at least until 2009. A proposal to fund the following four-year series of CiE conferences, starting in 2006, was submitted before the May 18, 2005, deadline:

- CiE 2006: *Logical approaches to computational barriers*. University of Wales Swansea, June 30 - July 5, 2006.
- CiE 2007: *Computation and Logic in the Real World*. University of Siena, Italy, June 18-23, 2007.
- CiE 2008: *Logic and Theory of Algorithms*. University of Athens, Greece. June 2008
- CiE 2009: *Mathematical Theory and Computational Practice*. University of Heidelberg, Germany. June 2009.

This proposed conference series is organised by the current CiE Management Committee, retitled for the proposal the *CiE Conference Series Steering Committee*. To some extent all this pre-empts the still very relevant question:

- **Do we agree to maintain a CiE conference series? And if so, what mechanisms need to be put in place to make this happen?**

What is in our conference proposal points in one direction, but this could change if we want.

The Marie Curie Research Training Network (RTN) Proposal

- **Should we apply within the new call for RTNs?** The deadline for proposals is September 8th, 2005. At the moment, we assume the answer is 'Yes'.

- **What form of network best draws together our needs, and those of the EU? The EU asks us to do things differently - how far are we willing to adapt?** The EU will want a funded network to:

    1. Carry out a specific focused research project.
    2. Make the training of young researchers its over-riding objective, with all of them placed where they can get a similarly high level of training.

3. Contain participants who have clearly defined and appropriate roles (particularly in terms of the expertise contained in each).
4. Be interdisciplinary and/or inter-sectorial (that is, have an industrial dimension).

Most of our research is basic, which makes focus one of our main problems. However, we believe that we can identify a small number of research *themes ,* grouped under the heading **Mathematical Models of Computation** (**MaMoC**), within which we can position very much (but not all) of the research activity within CiE. We also believe this is not just a presentational exercise, but of benefit to CiE as a research community.

Similarly, the emphasis on the development of young researchers involves some adaptation, which again can impact positively on the research.

Making sure the component parts of the network have a clear relationship to the research themes, and are given appropriate training roles, needs us to decide on a clear structure - see below.

Interdisciplinarity was built into CiE from the beginning. We just need to consolidate this and ensure its nature is clear to the EU evaluators.

We have tended to be self-deprecatory about our attractiveness to industrial partners. The results of this cannot be overcome very quickly. What has become clear though is that a number of major companies - e.g. Microsoft, IBM, Hewlett Packard - have research laboratories staffed by people with strong academic backgrounds. A number of them are keen to keep in touch with the sort of work done in CiE, and to make young researchers more aware of the opportunities offered by their companies.

- **How do we present CiE structurally as a RTN?** Here are three possible models:

MODEL 1. Retain all the current 14 CiE nodes within the proposed RTN with no difference in status between them inside the network.

MODEL 2. Keep all 14 nodes in the RTN, but distinguish two types of nodes: training nodes and training support nodes (TNs make 3-year appointments of PhD students, TSNs get 1/2 or 1 year visiting positions, possibly for postdocs).

MODEL 3 (the radical model). Only the nodes that can support 4 or more full-time Ph.D. students under the MaMoC-scheme are in the RTN. The others are mentioned as international collaborations.

How do the 3 models help us ensure that every participant has its role clearly defined, and that every PhD student gets a similar level of quality of training. Obviously Models 2 or 3 win easily here. But many of us reject Model 3 as being against the spirit of CiE. And it may be that too explicit a division into different categories of nodes may not play well with reviewers from certain countries, and not correspond to the full range of resources offered within CiE.

Some of us lean towards a melding of Models 1 and 2. This can be viewed as Model 1, with the sort of ruthlessness about where people are located contained in Models 2 and 3; or as Model 2, without any explicit division into first and second class nodes.

Comparisons with our original CiE proposal: In the original proposal we spread the money for young researchers thinly over the network, with mainly short term positions (typically, 3 month visits involving existing PhD students already in the network). This has been negatively characterised as ‘academic tourism’. Even under the old proposal, it was still not expected that every subnode would host visits. Now, we think we should to a large extent propose full PhD grants.

In the original proposal we had an explicit system of subnodes. The evaluation of this was negative, and, even if we now favour Model 1, we will have to de-emphasise the subnode structure in the new proposal. Some of the current CiE nodes are geographically widely spread, and only subnodes, or geographically clustered groups of subnodes, with a capacity to run a PhD program in CiE related topics may expect to host full PhD positions funded by the RTN. It may be that post-doctoral appointments need not be so constrained. It is also worth remembering that the young researchers employed by CiE would be expected to spend some time at a different node from that at which they are based, and this would probably involve visits to a wide spread of subnodes, including smaller subnodes with particular research specialisms.

- **To what extent should we concentrate PhD and post-doctoral positions within a small number of specially well-qualified centres?**

Of course, the main benefit for the majority of members of a funded CiE was always going to be the funding of research visits, conference participation, and other networking activities.

The Future Organisational Basis of CiE

Whether or not CiE is funded by the EU, it is already an established part of the international scene, and looks likely to stay. Even if the EU does not fund our conference series, we expect to organise further CiE meetings. On the other hand, CiE has grown so large that it already presents problems for anyone trying to present it to the EU for funding as a RTN.

- **Do we agree that CiE should develop as helpful environment within which many different funding initiatives might emerge?**

Whether or not CiE is funded as a network, it will be open to us to develop the organisation of CiE to best suit our long-term needs.

- **How should the membership of CiE be constituted, and what kind of management structure is most appropriate to its needs?**

One can think in terms of two basic models, for both of which there are successful examples to point to.

MODEL 1. Keep CiE organisationally simple and ad hoc, a well-organised network similar to the CCA network. It would maintain a useful website, and e-mailing list, and organise and sponsor meetings. The network would be run by those with the time and energy, its relationship with the membership being informal and consensual. Membership would be open and free.

MODEL 2. CiE becomes closer to being a learned society. The current Management Group and Coordinators' Panel become formalised within a proper constitution, with elected members and executive officers. Membership entails a subscription.

Both models have great advantages. Model 1 is closest to what we do now, and clearly works. However, the organisation as it is is very dependent on particular individuals, who can call on limited secretarial and technical support. Model 1 makes it difficult for CiE to draw on certain kinds of funding, and for CiE to fulfill the sort of wide-ranging role a more formally constituted organisation can.

Model 2 would enable CiE to be recognised as properly representing, and drawing on the support of, a clearly defined membership. The loss of informality and flexibility might be compensated for the higher functionality. CiE decision making and management would be more transparent, and the continuity of CiE as an organisation would be better safeguarded. One could envisage CiE devel-

oping the useful trappings of other learned societies, such as a journal, book series, support for young researchers, and so on.

Under either model, we would propose retaining the present basic organisational structure. The supreme authority, responsible for overall policy, should be a Council corresponding to our current Coordinators' Panel, ensuring representation of the different geographical regions of CiE, and of the various research areas (in particular, maintaining the balance between mathematics and computer science). There should be a small Management Committee to deal with the everyday executive matters. And there should be a Conferences Committee. The CiE annual conference, if this is to continue, would provide the opportunity for an Annual General Meeting, at which reports could be received and commented on, and policy scrutinised.

Not all these questions have to be addressed now. But the clearer we can be on the way forward, the more effectively and rapidly CiE can realise its potentially wide-ranging impact on our research area.

CiE Management Group
June 2005