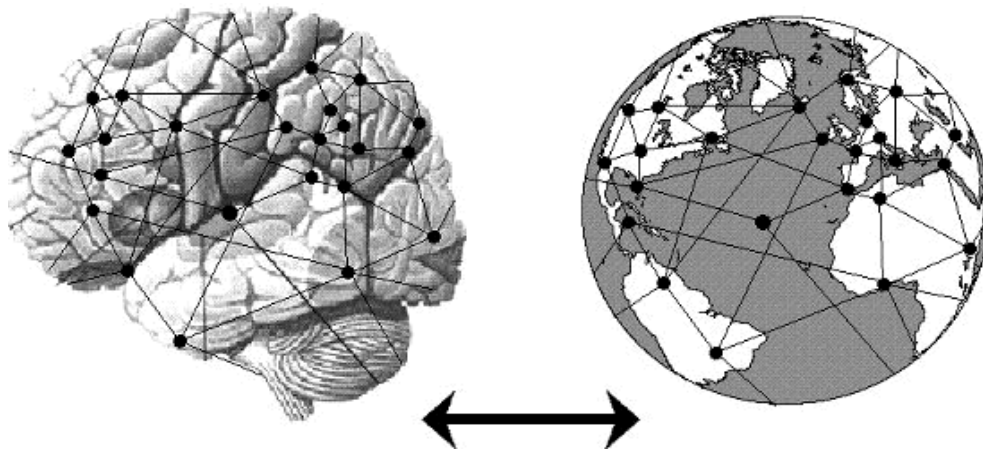# From Intelligent Networks to the Global Brain

The First Global Brain Workshop

July 3-5, 2001
Vrije Universiteit Brussel, Brussels, Belgium

Workshop Theme

The "Global Brain" is a metaphor for the emerging collectively intelligent network formed by the people of this planet together with the computers, knowledge bases, and communication links that connect them together. This network is an immensely complex, self-organizing system that not only processes information, but increasingly can be seen to play the role of a brain: making decisions, solving problems, learning new connections and discovering new ideas. No individual, organization or computer is in control of this system: its knowledge and intelligence are distributed over all its components. They emerge from the collective interactions between all the human and machine subsystems. Such a system may be able to tackle current and emerging global problems that have eluded more traditional approaches, but at the same time it will create new technological and social challenges which are still difficult to imagine.

Background and Motivation

Without doubt, the most important technological, economic and social development of the past decade is the emergence of a global computer-based communication network. This network has been growing at an explosive rate, affecting—directly or indirectly—ever more aspects of the daily lives of the people on this planet. Amidst this growing complexity, we need to look ahead, and try to understand where all these changes are leading to.

A general trend is that the information network becomes ever more global, more encompassing, more tightly linked to the individuals and groups that use it, and more intelligent in the way it supports them. The web doesn't just passively provide information, it now also actively alerts

and guides people to the best options for them personally. To support this, the web increasingly builds on the knowledge and intelligence of all its users and information providers collectively, thanks to technologies such as collaborative filtering, agents, and online markets. It appears as though the net is turning into a collective nervous system for humanity: a global brain.

Although these developments seem very modern, the underlying vision of society as a kind of organism has deep roots, going back to thinkers such as Aristotle, Spencer, and Teilhard de Chardin. We wish to explore this metaphor of the "global brain" as a guide to understand and steer future developments in science, technology and society, and as a basis for an integrating world view, that uses the insights gathered in different scientific disciplines in order to illuminate the place of us, humans, in the complex, evolving world that encompasses us.

The key goals of the workshop are to:
- Bring together a small, selected group of researchers involved in Global Brain related theorizing and applications.
- Have intensive discussions on all aspects of this common theme, and explore the differences and convergenges between the different approaches.
- Try to achieve a consensus on a general definition of "the Global Brain".
- Start preparing the program for a large-scale conference on the same theme, directed at a much wider audience, to be held in Silicon Valley in summer 2002.

Organization

The workhop is organized by the *Global Brain Group*, an international association of researchers founded in 1996, in collaboration with the Research Community on the "Construction of Integrating Worldviews", which is coordinated by the Center "Leo Apostel" (CLEA) at the Vrije Universiteit Brussel. It is funded by the Vrije Universiteit Brussel, and the Fund for Scientific Research-Flanders.

Workshop Chair

Francis Heylighen (Vrije Universiteit Brussel)

Workshop Committee
Joël de Rosnay (Cité des Sciences et de l'Industrie, Paris)
Bruce Edmonds (Manchester Metropolitan University)
Cliff Joslyn (Los Alamos National Laboratory)
Ben Goertzel (Webmind inc., New York)
Luis Rocha (Los Alamos National Laboratory)
Bryan Thompson (Global Wisdom inc., Washington DC)

Invited speakers
Gottfried Mayer-Kress (Pennsylvania State University)
Ben Houston (Carleton University, Ottawa)

Local Arrangements Committee
Francis Heylighen, Alex Riegler, Margeret Heath, Didier Durlinger, Bart d'Hooghe, Michael Pleumeekers, Eric Baert, Corinne Ciechanow

Papers

All workshop papers will be published on the website of the Global Brain Group, and a selection is likely to appear as a special issue of the journal "Foundations of Science". Many draft papers are already available on the web, and can be reached via the web page listing all abstracts of presentation and information about authors: http://pcp.vub.ac.be/Conf/GB-0-abs.html   It is recommended to print out and read this document with abstracts, and perhaps a few of the full papers linked to it, to acquaint yourself with the main ideas of the other workshop participants.

Edited video-recordings of the workshop will also be made available on the web, and we hope to build a "knowledge map" of the different ideas and positions on the basis of the transcripts from the video recordings. Thus the workshop website will hopefully develop into a complex knowledge web developing the global brain theme in its various ramifications.

Final Program

Mon, July 2

am: informal get-together at the Center Leo Apostel, followed by lunch at the university restaurant, for those who wish to already get acquainted

pm: possibility to test out infrastructure and presentations in the workshop room

Tue, July 3

am: welcome and lectures with questions

- Francis Heylighen (VUB): *Why the Global Superorganism Must Evolve a Brain*
- Cliff Joslyn (LANL): *What Could We Mean By "Global Brain": How Distributed Knowledge Systems Facilitate Social Control in Semiotic Agent-Based Architectures*
- Parker Rossman (ASIS World Brain group): *University and the Global Brain - Some Questions*
- Gottfried Mayer-Kress (Pennsylvania State University): *International Conferences as "Binding Events" in a Global Brain*

pm: lectures with questions:

- Bill Hibbard (University of Wisconsin): *Network Diameter and Emotional Values in the Global Brain*
- Bruce Edmonds (Manchester Metropolitan University): *Evolutionary Units and Adaptive Intelligence: why a brain could not be produced by internal evolutionary processes (but could be composed of such)*
- Susantha Goonatilake (New School for Social Research, New York): *Information currents in an interlinked ocean of genes, cultures and computing artifacts*

Discussion: *what is the GB and how does it evolve?*

Wed, July 4

am: lectures with questions

- Joël de Rosnay (Cité des Sciences et de l'Industrie, Paris): *Bioelectronic man/machine interfaces and symbiotic intelligent environments*
- Francis Heylighen (VUB): *Technologies for an Intelligent Web*
- Johan Bollen (LANL): *Experiments with web learning and spreading activation* (?)
- Bryan Thompson (Global Wisdom, Washington DC): *The Cognitive Web*

pm: lectures with questions

- Ben Goertzel (Webmind inc.): *The Webmind AI Engine as the Cortex of the Global Brain*
- Craig A. Kaplan (iQ inc. & University of California Santa Cruz): *Forecasting Stock Prices Using Collective Intelligence*
- Ben Goertzel (Webmind), Yuri V. Macklakov (Webmind), Vladimir G. Red'ko (Keldysh Institute of Applied Mathematics): *Model of Evolution of Web Agents*

Discussion: *which technologies can support the GB?*

Thu, July 5

am: lectures with questions

- Stephan Bugaj (Webmind): *Computer-Human Shared Intelligence*
- Ben Houston (Carleton University, Ottawa): *Augmenting Human Intellect*
- George Pór (Center for Advanced Learning Technologies, INSEAD): *Using Dynamic Knowledge Repositories to Support "Real-Time/Delayed Time" Synergy in Global Communities that Learn*
- Anthony Judge and Nadia McLaren (Union of International Associations, Brussels): *Simulating a Global Brain - Phobias, Delusions, Psychoses and All: using networks of international organizations, world problems, strategies, and values*

pm: lectures with questions

- Vladimir Mokiy (Informological Institute, Moscow): *Transdisciplinary safety of the "Global Brain" project*
- Shann Turnbull (Macquarie University, Sydney): *Design criteria for a Global Brain*

Discussion: *1) how should we design a GB?*
2) where do we go from here: GB conference, institutionalization of GB group?

Time Schedule

		Mon, July 2	Tue, July 3	Wed, July 4	Thu, July 5
10:00			Heylighen	de Rosnay	Bugaj
10:40		*possibility to meet*	Joslyn	Heylighen	Houston
11:20		*other participants*	*coffee pause*	*coffee pause*	*coffee pause*
11:50		*in CLEA*	Rossman	Bollen	Pór
12:30			Mayer	Thompson	Judge
13:10		*lunch*	*lunch*	*lunch*	*lunch*
14:10			Hibbard	Goertzel	Mokiy
14:50			Edmonds	Kaplan	Turnbull
15:30		*possibility to*	*coffee pause*	*coffee pause*	*coffee pause*
16:00		*test presentations*	Goonatilake	Goertzel et al.	discussion 1
16:40		*in workshop room*	discussion	discussion	discussion 2
19:00			*reception*	*workshop dinner*	

Practical Information

Presentations

Contributors will have 40 minutes for a presentation, but should take into account that this should include about 15 minutes for questions and discussion of their subject. They can use a blackboard, overhead projection of transparencies, or dataprojection from a PowerPoint or Web presentation. In the latter case, they are encourage to send us the file of their presentation before the workshop by email: <fheyligh@vnet3.vub.ac.be>, so that we can already install it on the computer that will be connected to the projector. If that is impossible, it is best to bring the presentation on a floppy disk or Zip disk (100 Mb), so that we can easily transfer it to the presentation computer. It is also possible to do the presentation from your own laptop computer, but in that case we cannot guarantee that the systems will be compatible.

We anyway recommend contributors to test out their electronic presentation before their actual time slot in the schedule, preferably on Monday afternoon, when we will be preparing the technical infrastructure, or otherwise during one of the coffee or lunch pauses. Otherwise, we may lose valuable time tackling software and hardware incompatibilities and bugs.

Location

The workshop will take place on the Campus "Oefenplein" of the *Vrije Universiteit Brussel - VUB*. This is the Dutch-speaking Free University of Brussels, and should not be confused with the neighboring French-speaking Free University, *ULB*. The workshop room G020 is situated in the central building G, one level above street level, and must be accessed from the "esplanade", the concrete walking area connecting the buildings F & G to the university restaurant R (see map at the end). A number of signs will help you find your way to workshop: look for signs mentioning CLEA (the name of our research center that is organizing the workshop).

The workshop room will have high speed Internet connection, data projection, overhead projection, a blackboard, telephone, and Windows and Mac computers, so as to allow live demonstrations. It will be possible to exhibit books, papers, or brochures on a side-table, so please bring anything with you that you would like others to see.

The campus further provides various facilities including a bank where you can change money (on the same esplanade, between buildings F and R), restaurants, cafés, library, fotocopying center, swimming pool, sauna, running track, and various sports fields. Workshop participants are welcome to visit us at our interdisciplinary research Center "Leo Apostel" (CLEA), in a somewhat untidy old house just outside the campus, at the address Krijgskundestraat 33 (see map), from Monday morning on.

Travel information

Brussels is very easy to reach. It is connected by high speed trains (between 1.5 and 3 hour journeys) to London, Paris, Cologne, and Amsterdam. Brussels Airport at Zaventem has direct flights from all major cities and indirect connections from virtually anywhere. The airport has a 15 minute train service three times per hour to the city centre (station Brussel Centraal), from where you can reach your hotel or the campus via the metro (subway). You can also get from the airport directly to the workshop location by taxi, but this is much more expensive (about BEF 1500 = $32).

The Campus is situated in the South-East part of Brussels, about 3 km/2mi from the city center, and is surrounded by three large avenues: Pleinlaan, Generaal Jacqueslaan and Triomflaan. Note that like everything in the bilingual Brussels, all streets have two names, a Dutch one (e.g.

Triomflaan, Krijgskundestraat), which *we* normally use, and a French one (e.g. Boulevard du Triomphe, Rue de la Strategie), which is more commonly used if you ask for directions.

The campus is a 10 minute metro (subway) drive from the historical city center (train/subway station Brussel Centraal). Take the metro line 1A direction Hermann-Debroux, and get off at station Petillon (see map). Take the exit on your left hand side when stepping out of the carriage. As you get out of the station into the Av. des Volontaires, you follow this street to the right for 5-10 minutes until you reach the campus. The campus can also be reached by train (stations Etterbeek or Delta), bus (lines 71, 34, 95, 96), or tramway (lines 23 and 90).

Brussels, the capital of Belgium and of Europe, and the surrounding attractions of Belgium provide many occasions for enjoyment and visits. They are certainly worth taking a few additional days for sightseeing. If you have only one day or less, make sure to walk around the *Grand' Place,* the magnificent central square with the medieval town hall, and the surrounding tourist area including the restaurants in the *Rue des Bouchers*. In July the weather is usually pleasantly warm, but it can always rain, so bring raincoat or umbrella, and take into account that Belgian weather is generally quite unpredictable.

Food

Breakfast and lunches can be taken inexpensively in the students' restaurant of the university, along the esplanade from the workshop room (building R on the map). Food costs about $6 for a three course meal (downstairs), less for sandwiches, fast food, coffee, sodas, etc (upstairs). To eat at the restaurant you need to buy guest tickets, which will be available at the workshop, or in the restaurant itself (just ask where you can buy tickets). The downstairs restaurant is open from 11.30 am to 1.45 pm. The snackbar and cafeteria upstairs are open from 7.30 am to 5 pm. You can also go to any of a number of nearby restaurants and snackbars. Many of them are concentrated on the Waversesteenweg, close to CLEA (see map), where you can also find shops and supermarkets.

Coffee pauses, with coffee, tea and cookies, and the evening reception with drinks and snacks will take place in the entrance hall just outside the workshop room G020. They are free for workshop participants. The workshop dinner on Wednesday night is not included, and will cost 1500 BF (about $32) per participant. It will include several courses of very fine food with appropriate wines and other drinks. It will take place in the gastronomical restaurant of the VUB, "Convivium", opposite the entrance hall, and next to the students' restaurant. For the other evenings, workshop participants are encouraged to just walk in small groups to one of the restaurant areas (Waversesteenweg, or in the opposite direction towards the ULB campus "Solbosch", which is outside of the map), and choose one of the many eating places they will encounter.

Accommodation

A small number of university guest rooms ($18-23 per day), in the immediate vicinity of the workshop location have been allocated to specific workshop participants. The participants who booked such a room will have to collect their keys at the little building of the night guards (look for the sign "bewaking") on campus, just behind the tall building G where the workshop takes place (see map). They also need to bring back their keys at the same place when they leave. This building is open 24 hours a day, and they have a list of registered guest room occupants.

The apartment buildings with the guest rooms are situated on the Triomflaan (see map), in between the campus and our CLEA center. The buildings with numbers 62 and 64 are close to CLEA, the one with number 19 is closer to the Generaal Jacqueslaan, and next to the "Colruyt" supermarket. The rooms have been assigned in the following way:

Triomflaan 62: room 3: HIBBARD (from 2/07), room 4: BUGAJ (from 2/07), room 5: EDMONDS (from 2/07), room 6: HAVEL (from 1/07)

Triomflaan 64: room 2: MAYER-KRESS (from 1/07)

Triomflaan 19: room 11: HOUSTON and KAPLAN (from 1/07), room 312: ROSSMAN and TURNBULL (from 2/07)

For participants staying in a hotel, it is best to inquire at the hotel how to best get to the campus (clearly specifying that you want to be at the Dutch Free University, VUB, not the French ULB) by public transport.

Useful phone numbers
Center "Leo Apostel":   02 - 644 26 77
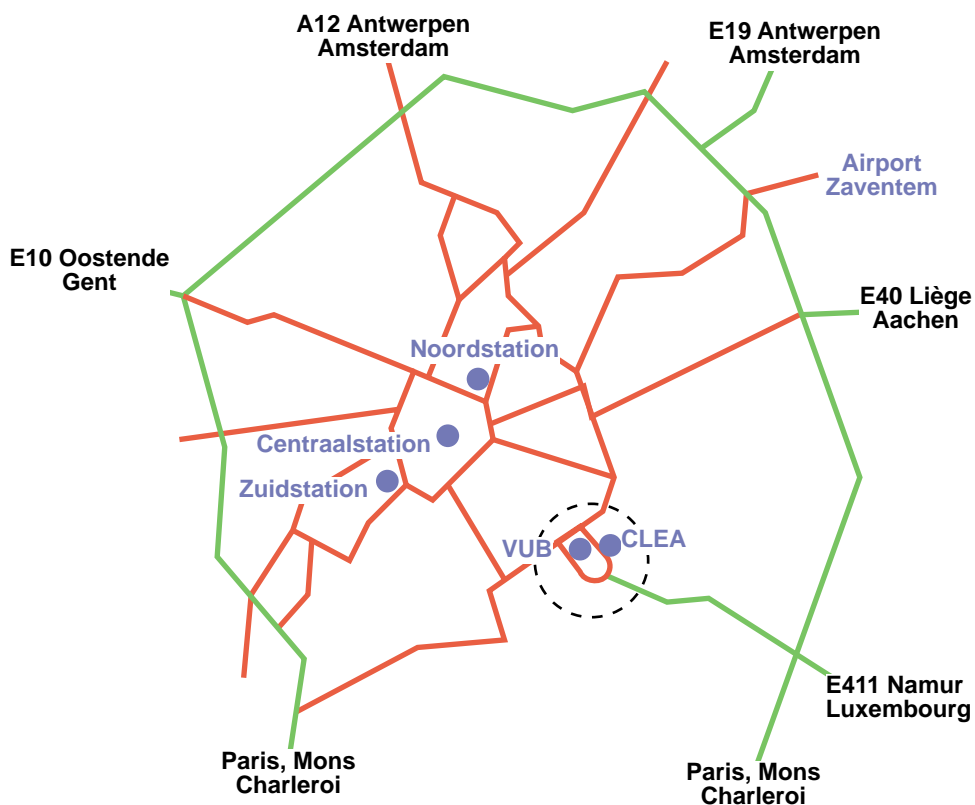Campus security ("bewaking"):   02 - 629 21 76 (for guest rooms, available 24h/24h)
Michael Pleumeekers :   0486 - 93 86 90 (local arrangements, cell phone)
Francis Heylighen: 0486 - 93 00 83 (workshop chair, cell phone)
For all numbers, replace 0xxxx by + 32xxxx (+: international code, 32: country code) if you phone from outside Belgium.

Maps

Map of the main roads in and around Brussels, situating the VUB campus with respect to the center ("Centraal Station") and the airport.

The map belows shows the campus itself with its direct surroundings, including the Metro station Petillon, the Center "Leo Apostel" (CLEA), the workshop location in building G, the university restaurant R, the guest room buildings on the Triomflaan, and the building of the "bewaking", where guest room occupants can collect their keys.