

# The UNESCO UniTwin Digital Campus for Complex Systems: a global experiment in high-quality no-cost education



Welcome to the e-Laboratories Portal of the  
*Complex Systems Digital Campus*  
a UNESCO UniTwin Network

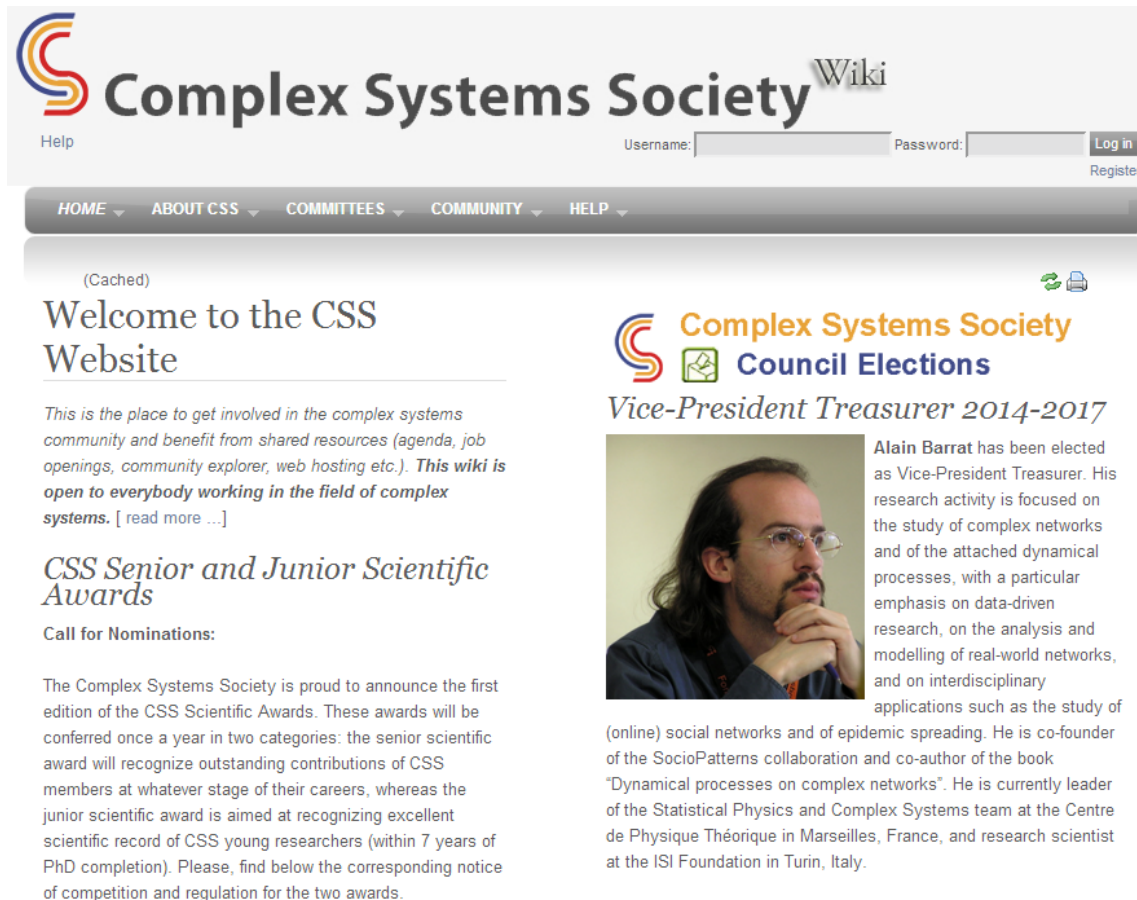
Jeff Johnson,	Open University
Paul Bourguine,	OU & École Polytechnique
Jorge Louçã,	OU & Lisbon University Institute
Cristian Jimenez-Romero,	Open University
David Rodrigues,	Open University
Jane Bromley,	Open University



The Open University

Coordinating the European Complex Systems community  
2004 – 2014 OU has been a major player:

2004 Founder member of the Complex Systems Society



The screenshot shows the homepage of the Complex Systems Society Wiki. At the top, there is a logo consisting of a stylized 'S' made of three curved lines in blue, orange, and red. To the right of the logo is the text 'Complex Systems Society Wiki'. Below the logo is a 'Help' link. To the right of the logo is a login section with fields for 'Username:' and 'Password:', and buttons for 'Log in' and 'Register'. Below the login section is a navigation bar with links: 'HOME', 'ABOUT CSS', 'COMMITTEES', 'COMMUNITY', and 'HELP'. Below the navigation bar is a section titled 'Welcome to the CSS Website'. To the right of this section is a section titled 'Complex Systems Society Council Elections Vice-President Treasurer 2014-2017'. Below this section is a photo of Alain Barrat. To the right of the photo is a text block about Alain Barrat. Below the photo and text block is a section titled 'CSS Senior and Junior Scientific Awards'. Below this section is a text block about the awards. Below the text block is a section titled 'Call for Nominations:'. Below this section is a text block about the awards.

(Cached)

## Welcome to the CSS Website


*This is the place to get involved in the complex systems community and benefit from shared resources (agenda, job openings, community explorer, web hosting etc.). **This wiki is open to everybody working in the field of complex systems.** [ read more ... ]*

### CSS Senior and Junior Scientific Awards

**Call for Nominations:**

The Complex Systems Society is proud to announce the first edition of the CSS Scientific Awards. These awards will be conferred once a year in two categories: the senior scientific award will recognize outstanding contributions of CSS members at whatever stage of their careers, whereas the junior scientific award is aimed at recognizing excellent scientific record of CSS young researchers (within 7 years of PhD completion). Please, find below the corresponding notice of competition and regulation for the two awards.

### Complex Systems Society Council Elections Vice-President Treasurer 2014-2017



**Alain Barrat** has been elected as Vice-President Treasurer. His research activity is focused on the study of complex networks and of the attached dynamical processes, with a particular emphasis on data-driven research, on the analysis and modelling of real-world networks, and on interdisciplinary applications such as the study of (online) social networks and of epidemic spreading. He is co-founder of the SocioPatterns collaboration and co-author of the book "Dynamical processes on complex networks". He is currently leader of the Statistical Physics and Complex Systems team at the Centre de Physique Théorique in Marseilles, France, and research scientist at the ISI Foundation in Turin, Italy.



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2004 Founder member of European Conference on CS



The screenshot shows the ECCS'14 website for the European Conference on Complex Systems. The header features the ECCS'14 logo, a red gear-shaped badge for 'Lucca September 22-26 2014', and logos for IMT and the Complex Systems Society. A navigation bar includes links for Home, Program, Satellites, Submission, Registration, Sponsors, Location, Accommodation, and General Info. The main content area has a large image of the Leaning Tower of Pisa. A sidebar on the right displays tweets from Matteo Chinazzi (@matik7) and a photo gallery. The footer contains a description of the conference, a list of conference tracks, and a link to download ECCS'14 leaflet and ECCS'14 poster.

**ECCS'14**  
European Conference on Complex Systems

**Lucca**  
September 22-26 2014

IMT  
INSTITUTE FOR ADVANCED STUDIES  
LUCCA

COMPLEX SYSTEMS SOCIETY

Home Program Satellites Submission Registration Sponsors Location Accommodation General Info

Tweets  
Matteo Chinazzi @matik7 5 May offers registration for 10 students at ECCS'14 | Retweeted by ECCS 2014  
Tweet to @eccs14

Photo Gallery

**Sponsors**  
MULTIPLEX

**Previous editions**  
ECCS' 13 Barcelona  
ECCS' 12 Brussels  
ECCS' 11 Vienna  
ECCS' 10 Lisbon  
ECCS' 09 Warwick  
ECCS' 08 Jerusalem  
ECCS' 07 Dresden  
ECCS' 06 Oxford  
ECCS' 05 Paris  
ECCS' 04 Torino

ECCS'14 will be a major international conference and event in the area of complex systems and interdisciplinary science in general. It will offer unique opportunities to study novel scientific approaches in a multitude of application areas.

The conference will cover a broad range of subjects on all aspects of Complex Systems, as reflected by the following conference tracks:

- Foundations of Complex Systems
- Information and Communication Technologies
- Infrastructures, Planning and Environment
- Biological Complexity
- Language, Linguistics Cognition and Social Systems
- Economics and Finance

Download [ECCS'14 leaflet](#) and [ECCS'14 poster](#)

## Previous editions

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ECCS' 08 Jerusalem  
ECCS' 07 Dresden  
ECCS' 06 Oxford  
ECCS' 05 Paris  
ECCS' 04 Torino



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2004 Founder member of ECCS

Major role coordinating the Complex Systems Community

2005 – 2008 € 1 m ONCE-CS Coordination Action

2009 – 2012 € 900 K ASSYST Coordination Action

2011 – 2014 € 600 K Étoile Coordination Action

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work packages for a UNESCO chair in complex systems

... which escalated to a UniTwin network



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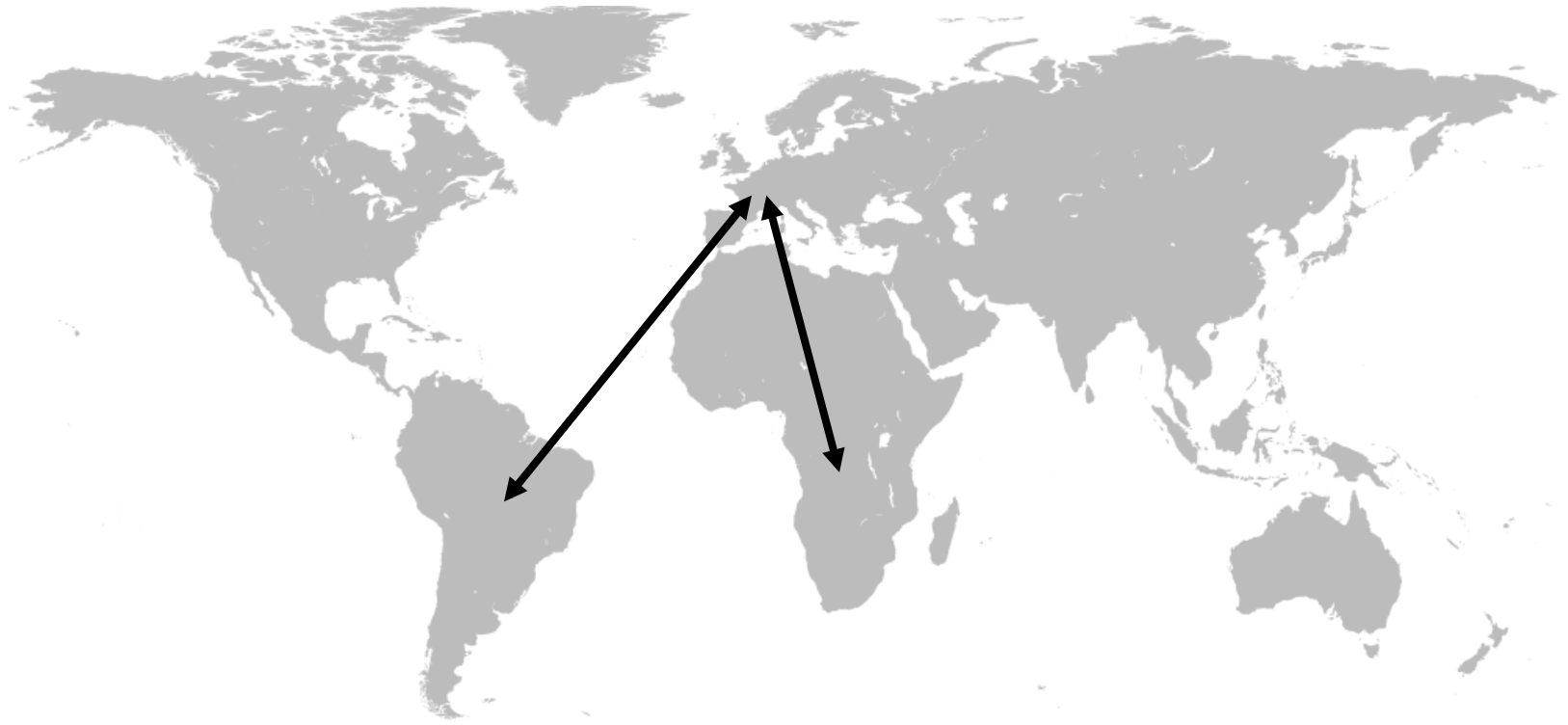
... which escalated to a UniTwin network

**2014 Founder Member of the CS-DC UNESCO UniTwin**

CS-DC = Complex-Systems Digital campus



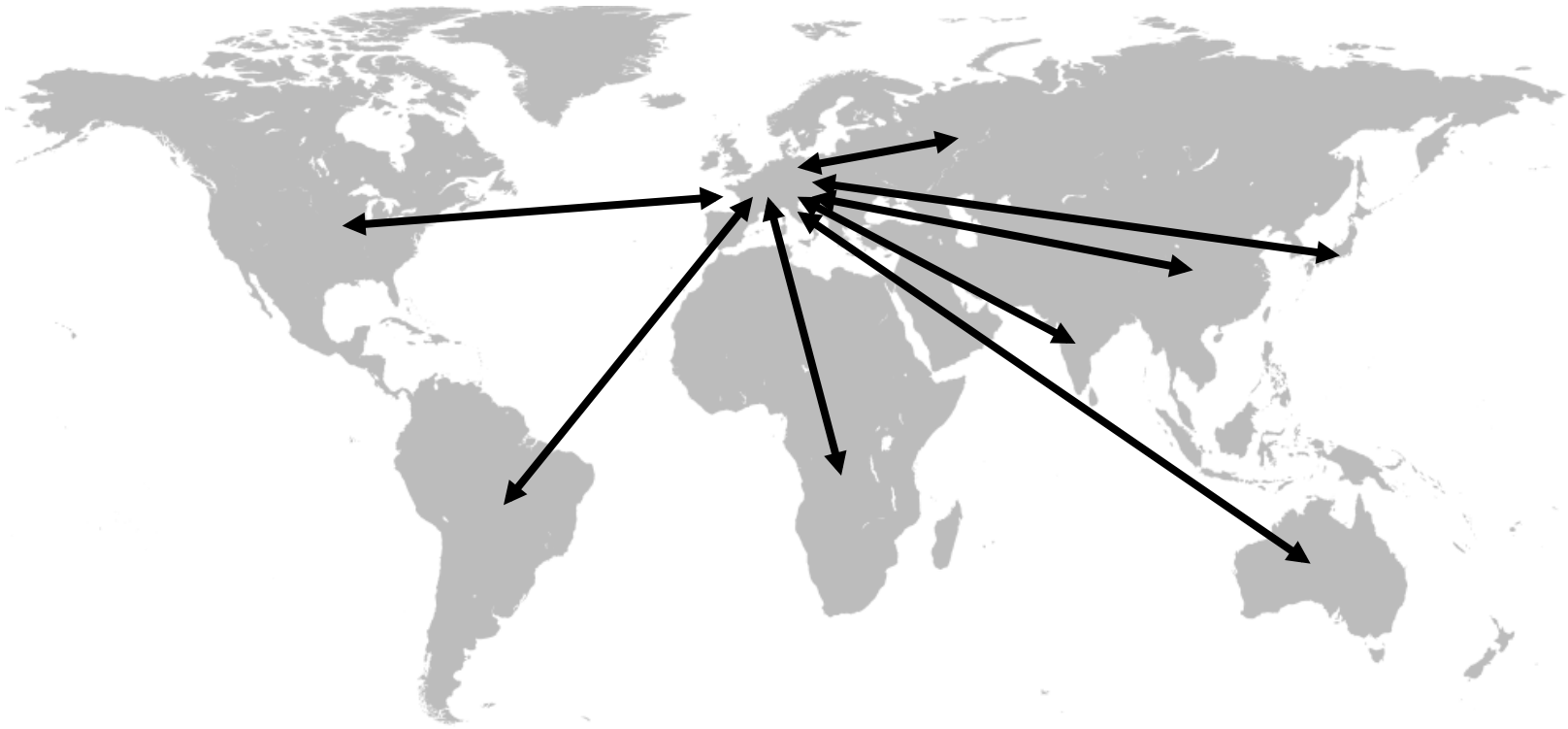
# The UNESCO Complex Systems Digital Campus



UNITWIN – linking Europe with two regions  
Africa & Latin America



# The UNESCO Complex Systems Digital Campus



UNITWIN – linking Europe with two regions

Africa & Latin America - & now world wide

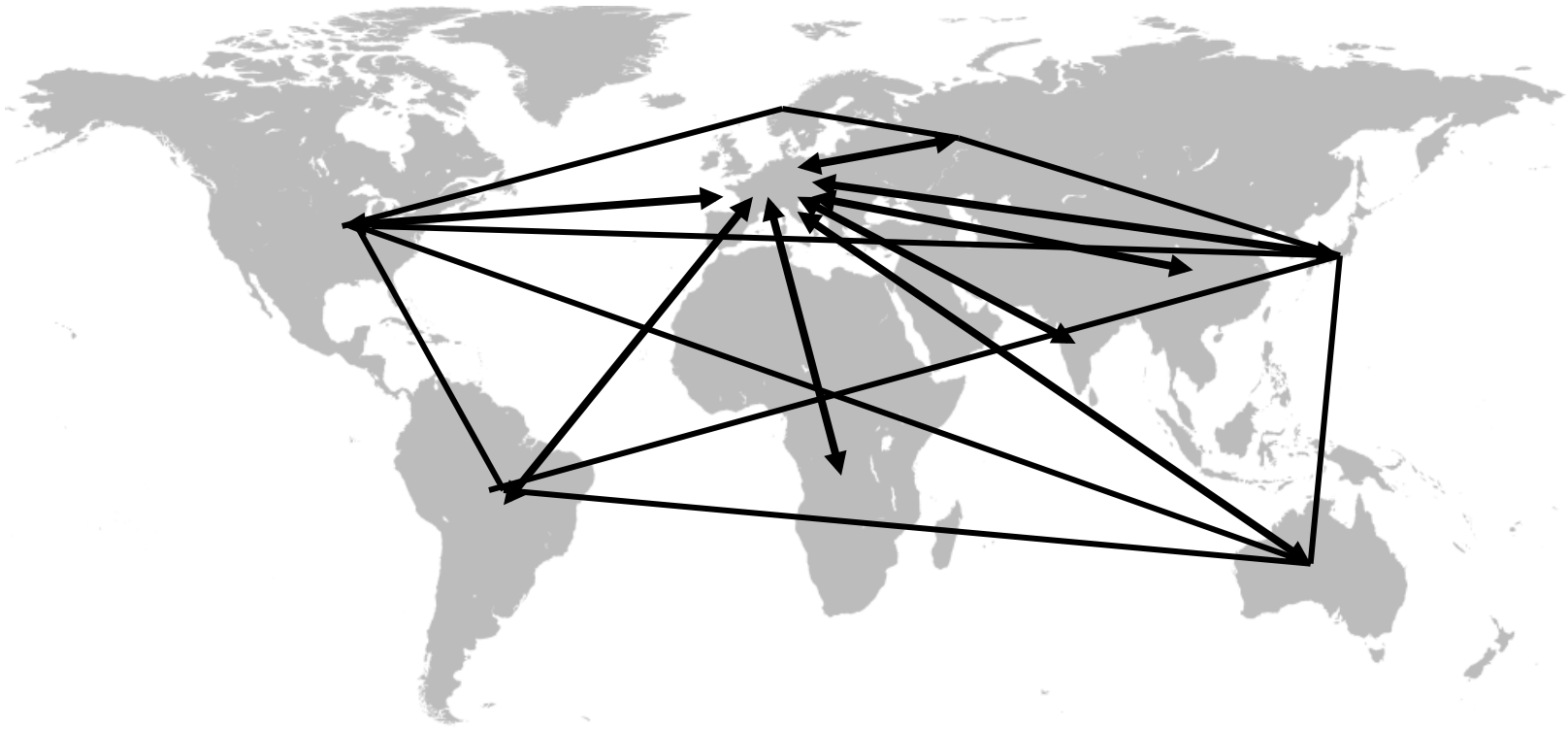
100+ top Universities, and growing



The Open University



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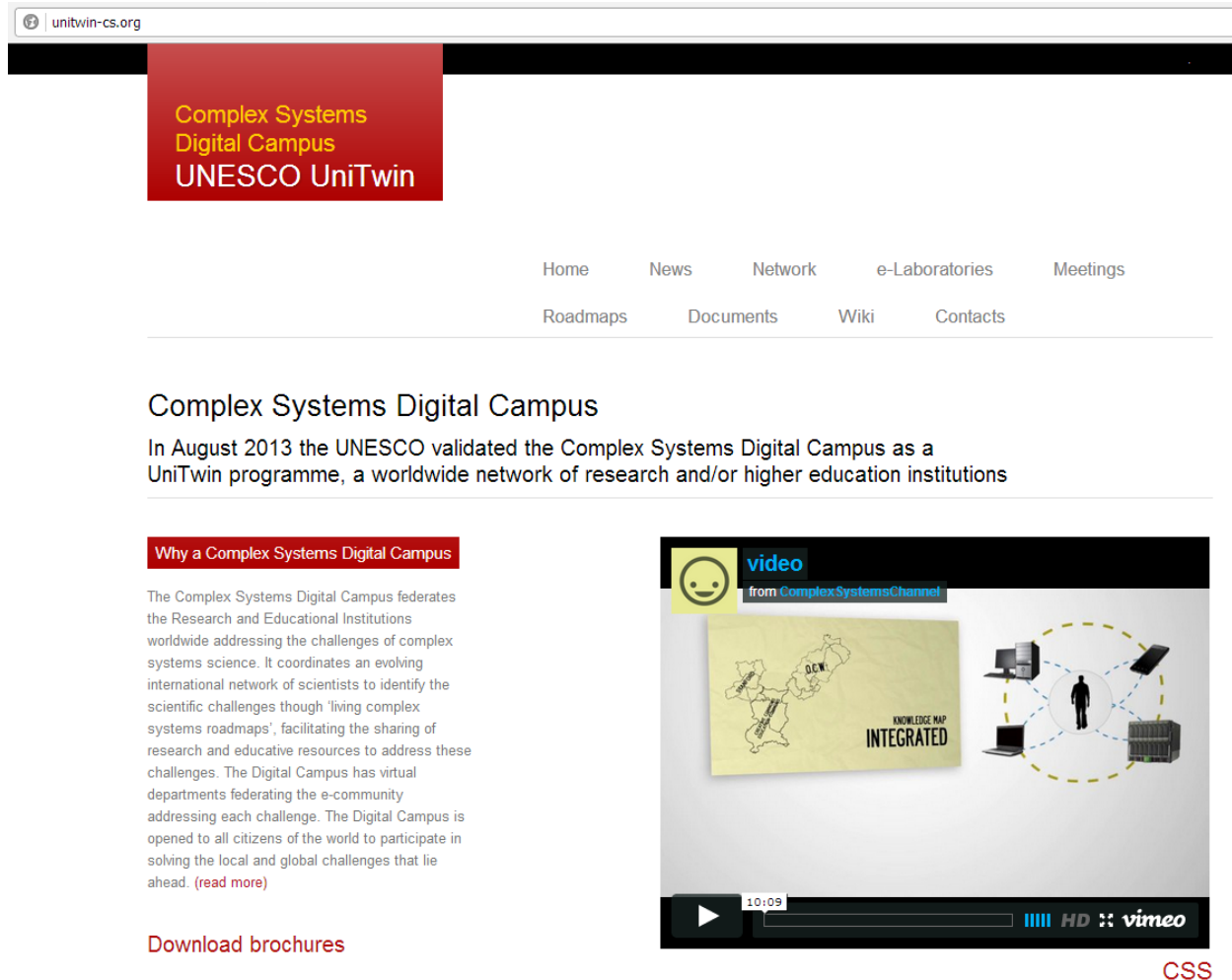
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# The UNESCO Complex Systems Digital Campus



The screenshot shows the homepage of the UNESCO Complex Systems Digital Campus website. At the top, there is a black navigation bar with a red box containing the text "Complex Systems Digital Campus UNESCO UniTwin". Below this, a white navigation bar lists links: Home, News, Network, e-Laboratories, Meetings, Roadmaps, Documents, Wiki, and Contacts. The main content area features the title "Complex Systems Digital Campus" followed by a paragraph: "In August 2013 the UNESCO validated the Complex Systems Digital Campus as a UniTwin programme, a worldwide network of research and/or higher education institutions". Below this is a section titled "Why a Complex Systems Digital Campus" with a text block and a "read more" link. To the right of the text is a video player showing a video titled "video from ComplexSystemsChannel" with a thumbnail of a "KNOWLEDGE MAP INTEGRATED" and a diagram of a network. The video player includes a play button, a progress bar, and a "vimeo" logo. At the bottom right of the video player, the text "CSS" is visible.

unitwin-cs.org

Complex Systems  
Digital Campus  
UNESCO UniTwin

Home News Network e-Laboratories Meetings  
Roadmaps Documents Wiki Contacts

## Complex Systems Digital Campus

In August 2013 the UNESCO validated the Complex Systems Digital Campus as a UniTwin programme, a worldwide network of research and/or higher education institutions

### Why a Complex Systems Digital Campus

The Complex Systems Digital Campus federates the Research and Educational Institutions worldwide addressing the challenges of complex systems science. It coordinates an evolving international network of scientists to identify the scientific challenges through 'living complex systems roadmaps', facilitating the sharing of research and educative resources to address these challenges. The Digital Campus has virtual departments federating the e-community addressing each challenge. The Digital Campus is opened to all citizens of the world to participate in solving the local and global challenges that lie ahead. ([read more](#))

Download brochures

CSS

**International  
consortium  
to share  
resources in  
research and  
teaching**

**[www.unitwin-cs.org](http://www.unitwin-cs.org)**



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# **The UNESCO Complex Systems Digital Campus**

## **The Educational Challenge**

**Complex Systems Science is highly interdisciplinary**

**[www.unitwin-cs.org](http://www.unitwin-cs.org)**



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# The UNESCO Complex Systems Digital Campus

## The Educational Challenge

**Complex Systems Science is highly interdisciplinary**

**Almost all of us**

**Know almost nothing**

**About almost everything**

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## **The Educational Challenge**

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**How to provide mass education at no cost for the international Complex Systems Research Community?**

**[www.unitwin-cs.org](http://www.unitwin-cs.org)**



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## The Educational Challenge

**Complex Systems Science is highly interdisciplinary**

**Almost all of us**

**Know almost nothing**

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**How to provide mass education at no cost for the international Complex Systems Research Community?**

**- scalable high quality postgraduate education**

**[www.unitwin-cs.org](http://www.unitwin-cs.org)**



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# **The UNESCO Complex Systems Digital Campus**

**The Educational Challenge: scalable no-cost education**

**(1) Study materials ?**

**(2) Assessment & certification ?**

**[www.unitwin-cs.org](http://www.unitwin-cs.org)**



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# The UNESCO Complex Systems Digital Campus

## The Educational Challenge: scalable no-cost education

### (1) Study materials ?

#### Étoile

Enhanced Technology for Open Intelligent Learning Environments

Crowd-sourced ecology of URLs

### (2) Assessment & certification ?

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Automated marking

Peer Assessment

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**The Educational Challenge: scalable no-cost education**

**How to make peer marking robust for certification ?**

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**The Educational Challenge: scalable no-cost education**

**How to make peer marking robust for certification ?**

**Discriminate good markers from bad markers**

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**The Educational Challenge: scalable no-cost education**

**How to make peer marking robust for certification ?**

**Discriminate good markers from bad markers**

**Heuristic: good markers must be highly connected**

**Bad markers must be relatively disconnected**

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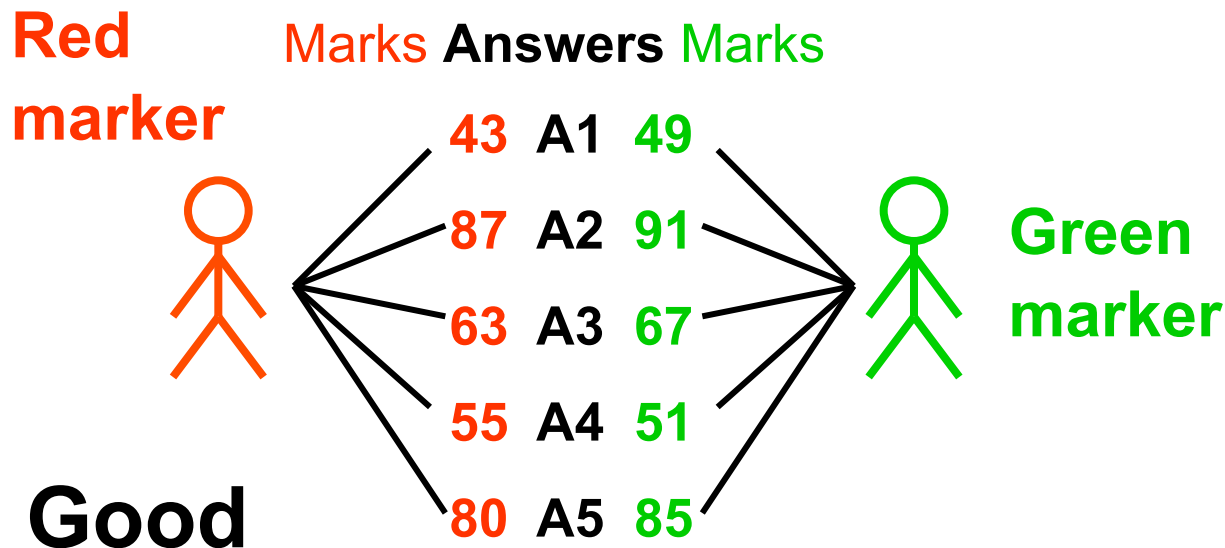
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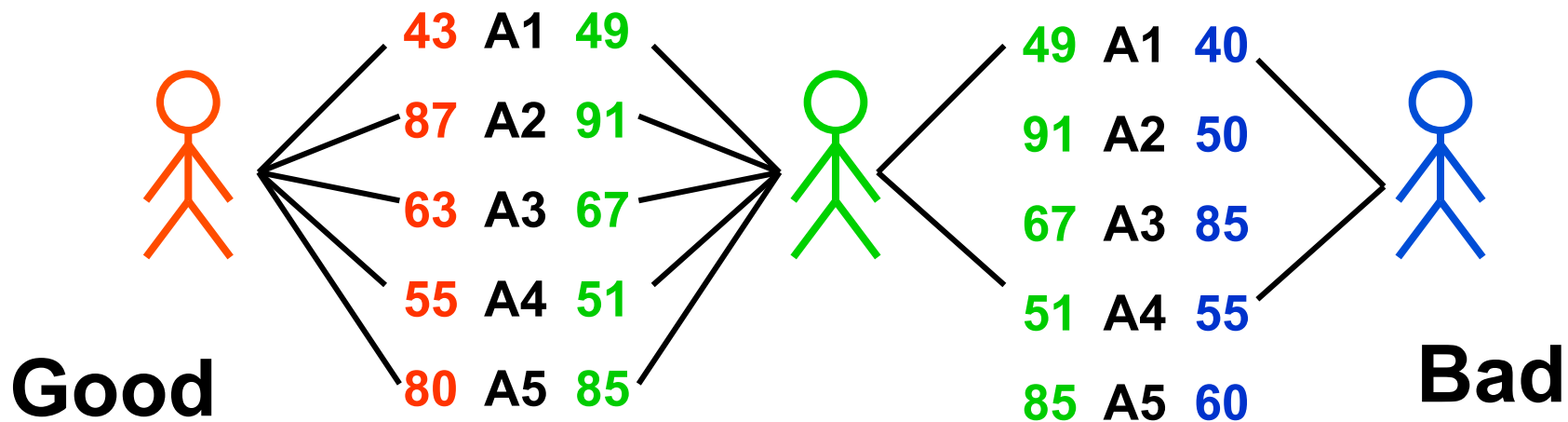
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**We can design the marking to optimise connectivity**

**Also students self-mark**

**And marking is symmetric – if I mark you, you mark me.**





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**Current experiment – 48 students, 7 lessons,**

**5 questions per lesson**



# The UNESCO Complex Systems Digital Campus

## Conclusions

- **UNESCO CS-DC is major worldwide research network**
- **Need high-quality no-cost certificated mass education**
- **Automated marking is OK, but not sufficient**
- **‘Intelligent’ peer marking is very promising**
- **Use ‘hypernetwork’ methods to detect good markers**
- **We are running an experiment ending at the end of May**

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