

Characterizing the geographical organization of the International Institute of Intellectual Cooperation via network cartography

Alessio Cardillo (@a_cardillo)

Internet Interdisciplinary Institute (IN3) – Universitat Oberta de Catalunya, Barcelona (Spain)

CS³ meeting – Santander
Thursday, May 4th 2023



Universitat Oberta
de Catalunya



- <https://www.imdb.com/title/tt0020629/>

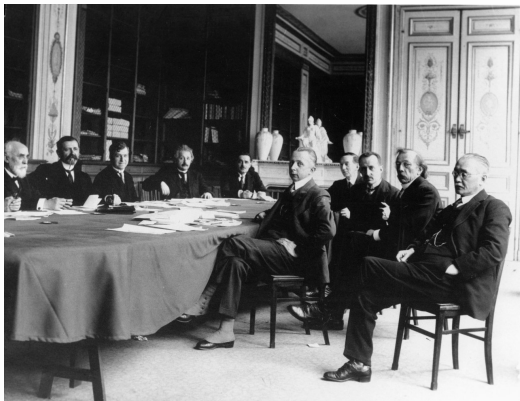
International Committee on Intellectual Cooperation (ICIC)

- Founded in 1922.
- Based in Geneva.
- Advisory organization of the League of Nations.

- <https://unesco.libguides.com/IICI>

International Committee on Intellectual Cooperation (ICIC)

- Founded in 1922.
- Based in Geneva.
- Advisory organization of the League of Nations.



• <https://unesco.libguides.com/IICI>

International Committee on Intellectual Cooperation (ICIC)

- Founded in 1922.
- Based in Geneva.
- Advisory organization of the League of Nations.



• <https://unesco.libguides.com/IICI>

International Committee on Intellectual Cooperation (ICIC)

- Founded in 1922.
- Based in Geneva.
- Advisory organization of the League of Nations.

International Institute of Intellectual Cooperation (IIIC)

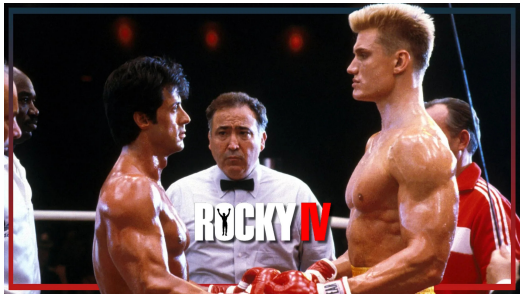
- Founded in 1926.
- Based in Paris.
- Created to support the work ICIC as an **executive branch**.
- Ancestor of UNESCO.

International Committee on Intellectual Cooperation (ICIC)

- Founded in 1922.
- Based in Geneva.
- Advisory organization of the League of Nations.

International Institute of Intellectual Cooperation (IIIC)

- Founded in 1926.
- Based in Paris.
- Created to support the work ICIC as an **executive branch**.
- Ancestor of UNESCO.



Characterize the IIIC's geographical organization and, challenge the mainstream view on international cultural cooperation



Data

The data: UNESCO's archives

The screenshot shows the UNESCO Archives AtoM Catalogue interface. The top navigation bar is blue and contains the UNESCO logo, the title "UNESCO Archives AtoM Catalogue", the motto "Building peace in the minds of men and women", and a search bar with the text "Search UNESCO Archives". Below the navigation bar, the main content area is divided into two columns. The left column contains a sidebar with the text "UNESCO Archives" and a "Quick search" box. The right column displays a hierarchical tree structure of the archive, starting with "Archive Group AG 1 - International Institute of Intellectual Co-operation". The tree includes folders for "Fonds", "Series", and "Subseries", with detailed descriptions for each. A "Log in" button is visible in the top right corner.

United Nations
Educational, Scientific and
Cultural Organization

UNESCO Archives AtoM Catalogue

"Building peace in the minds of men and women"

Browse Search UNESCO Archives Log in

UNESCO Archives

Quick search

Search hierarchy

Archive Group AG 1 - International Institute of Intellectual Co-operation

- [Archive Group] AG 1 - International Institute of Intellectual Co-operation, 1921-1954
 - [Fonds] IICI - International Institute of Intellectual Co-operation fonds, 1921-1954
 - [Series] IICI Correspondence Files, 1923-1949
 - [Subseries] A - Correspondance relative aux Commissions nationales, Délégués d'Etats et Affaires générales de la Di...
 - [Subseries] B - Correspondance relative aux relations diverses entre pays, 1925-1946
 - [Subseries] C - Correspondance relative aux questions des relations universitaires, début de la Conférence permane...
 - [Subseries] D - Correspondance relative aux questions scientifiques, Bibliothèques et Congrès bibliothécaires, Bibliog...
 - [Subseries] DD - Correspondance de la Section des Sciences historiques et sociales, 1924-1940

Other languages available

<https://atom.archives.unesco.org/iiic>

The data: UNESCO's archives

Subseries A - Correspondance relative aux Commissions nationales, Délégués d'Etats et Affaires générales de la Direction

- [-] [Archive Group] AG 1 - International Institute of Intellectual Co-operation, 1921-1954
 - [-] [Fonds] IICI - International Institute of Intellectual Co-operation fonds, 1921-1954
 - [-] [Series] IICI Correspondence Files, 1923-1949
 - [+] [Subseries] A - Correspondance relative aux Commissions nationales, Délégués d'Etats et Affaires générales de la Di...
 - [-] [Subseries] B - Correspondance relative aux relations diverses entre pays, 1925-1946
 - [-] [Subseries] C - Correspondance relative aux questions des relations universitaires, début de la Conférence perman...
 - [-] [Subseries] D - Correspondance relative aux questions scientifiques, Bibliothèques et Congrès bibliothécaires, Bibliog...
 - [-] [Subseries] DD - Correspondance de la Section des Sciences historiques et sociales, 1924-1940

<https://atom.archives.unesco.org/iic>

The data: UNESCO's archives

58/23907/5894

Genève, le 25 janvier 1939.

Monsieur le Ministre,

--- J'ai l'honneur de vous communiquer ci-joint le rapport et la résolution (document C.51.1939.XIII) adoptés par le Conseil de la Société des Nations le 18 janvier 1939 (104e session), concernant la composition de la Commission internationale de coopération intellectuelle.

Comme vous le constatarez, le Conseil a décidé de prolonger, pour une nouvelle période de trois ans, votre mandat de membre de la Commission internationale de coopération intellectuelle.

Votre nouveau mandat prendra fin le 31 décembre 1941.

Je vous serais reconnaissant de vouloir bien me faire savoir si vous êtes en mesure d'accepter le renouvellement de votre mandat.

Veuillez agréer, Monsieur le Ministre, les assurances de ma haute considération.

Le SECRÉTAIRE GÉNÉRAL :

J. PÉREZ

S.E. Monsieur F. GARCIA CALDERON
ministre plénipotentiaire du Pérou en France
69, avenue Nid
PARIS

The data: UNESCO's archives

Origin
Country
(Switzerland)

58/23907/0894

Genève, le 25 janvier 1939.

Monsieur le Ministre,

--- J'ai l'honneur de vous communiquer ci-joint le rapport et la résolution (document C.51.1939.XII) adoptés par le Conseil de la Société des Nations le 1^{er} janvier 1939 (104^e session), concernant la composition de la Commission internationale de coopération intellectuelle.

Comme vous le constaterez, le Conseil a décidé de prolonger, pour une nouvelle période de trois ans, votre mandat de membre de la Commission internationale de coopération intellectuelle.

Votre nouveau mandat prendra fin le 31 décembre 1941.

Je vous serais reconnaissant de vouloir bien me faire savoir si vous êtes en mesure d'accepter le renouvellement de votre mandat.

Veuillez agréer, Monsieur le Ministre, les assurances de ma haute considération.

Le SECRÉTAIRE GÉNÉRAL :

J. PÉRON.

Destination
Country
(France)

S.E. Monsieur F. GARCIA CALDERON
Ministre plénipotentiaire du Pérou en France
68, avenue Foch
PARIS

158

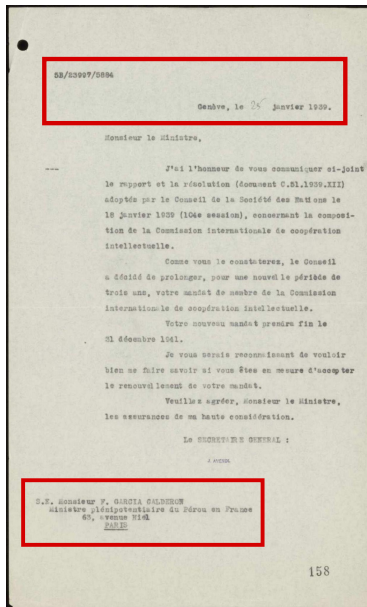
The data: UNESCO's archives

Switzerland

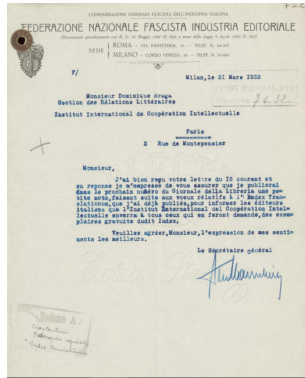


$$w_{ij} = 1$$

France



The data: UNESCO's archives



CONFEDERACION ZIONISTA

FEDERAZIONE NAZIONALE

(Comitato permanente via R. D. 26

50131 ROMA

SEDI | MILANO

7/

Monsieur Dossin
Section des Relations
Institut International

Monsieur,

En réponse à l'ai le
dona le prochain
site actual, l'Institut
statistiques, que l'Institut
Chilien des 12
Instituto General

Veuillez
ment le melle.

COMISION CHILENA DE COOPERACION INTELCTUAL

CARTEL 12-D SANTIAGO

MEMORIA DE LA COMISION CHILENA DE COOPERACION INTELCTUAL

DEL 19 DE AGOSTO AL 2 DE SEPTIEMBRE DE 1977

La Comisión Chilena de Cooperación Intelectual, en el curso de este año, ha logrado desarrollar sus actividades en dos sectores en el desarrollo de la propia organización y en la difusión de nuestra cultura en los demás países. Todo esto ha sido hecho en un plano modesto y limitado; con medio externo y con las dificultades inherentes a cualquier actividad pero ha sido bueno.

Instituto Chileno Argentino.

El Instituto Chileno Argentino que se constituyó hace tres años, ha tenido participación importante en la celebración del aniversario argentino, ha promovido conferencias por radio, atendió a la delegación de docentes argentinos que vinieron a dar cursos en este país, ha dado vínculo a la redacción de los manuscritos y ha cambiado la presentación de los trabajos de los investigadores de diferentes países sobre temas que involucran al desarrollo de las relaciones científicas entre uno y otro país, también se ha seguido de realizar el intercambio de profesores y las actividades respectivas permiten asegurar que pronto una iniciativa será un hecho.

Instituto Chileno-Boliviano.

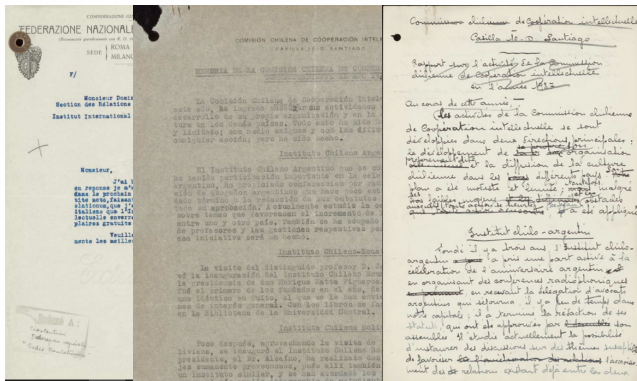
La visita del distinguido profesor P. José Gabriel Navarro, secretario de la inauguración del Instituto Chileno-Boliviano de Cultura, bajo la presidencia de don Enrique Santa Philomena. Este nuevo organismo, que es el primero de los fundados en el año, fortaleció la conexión de uno idéntico en Chile, al que se le han enviado libros y comunicaciones de interés general. Con los libros se formará una biblioteca chilena en la biblioteca de la Universidad General.

Instituto Chileno-Boliviano.

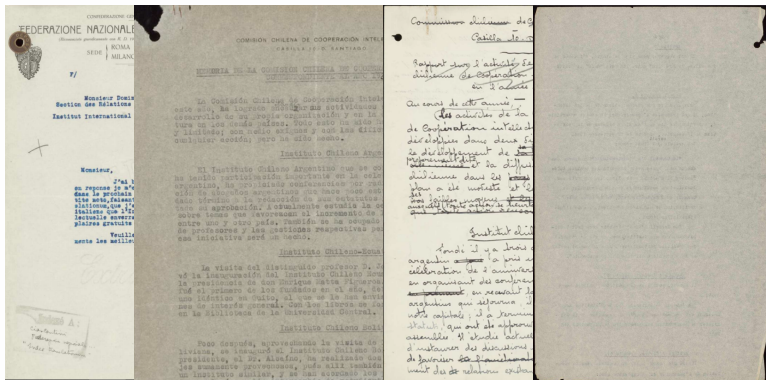
Poco después, aprovechando la visita de la Misión General Boliviana, se inauguró el Instituto Chileno-Boliviano de Cultura. Su presidente, el Dr. Alfonso, ha realizado los viajes a Bolivia, visitando personalmente, además también se ha logrado constituir un Instituto similar, y se han acordado los procedimientos para establecer una biblioteca chilena en la biblioteca de la Universidad General.

Enviado a:
Comisión
Federación zionista
de Chile

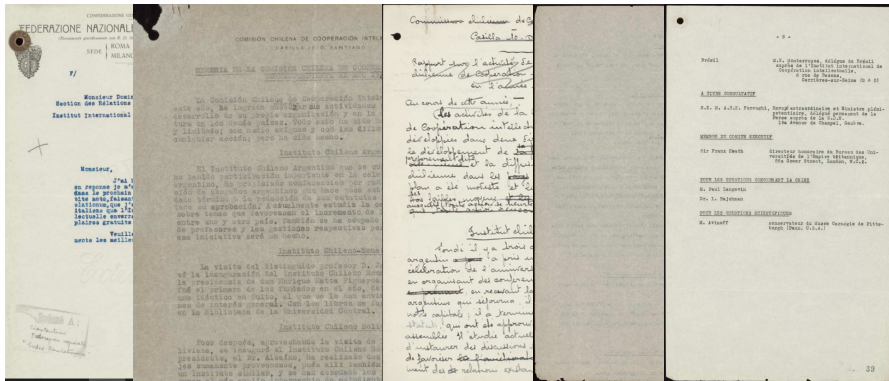
The data: UNESCO's archives



The data: UNESCO's archives



The data: UNESCO's archives



The data: UNESCO's archives



The data: UNESCO's archives



Note 1

Of the 12,230 letters available in Folder A, we consider only 4,265 (*i.e.* 35% of the whole corpus).

Note 2

We have analyzed also documents from Folder F (results not shown).

Network cartography in a nutshell

Network cartography in a nutshell

- A technique to **assign roles to nodes** by studying their connectivity pattern.

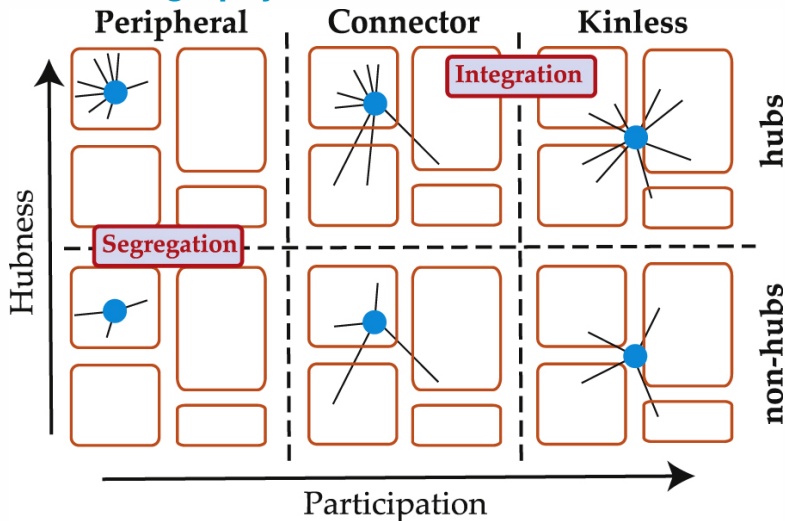
- R. Guimerá, and L. A. N. Amaral, "*Functional cartography of complex metabolic networks*". Nature, **433**, 895, (2005). DOI:10.1038/nature03288

Network cartography in a nutshell

- A technique to **assign roles to nodes** by studying their connectivity pattern.
- **It requires a partition of the network into groups** (*i.e.* the results **depend** on the partitioning criteria).

- R. Guimerá, and L. A. N. Amaral, "*Functional cartography of complex metabolic networks*". Nature, **433**, 895, (2005). DOI:10.1038/nature03288

Network cartography in a nutshell



- F. Klimm, et al. "Individual node's contribution to the mesoscale of complex networks". New Journal of Physics, **16**, 125006, (2014). DOI:10.1088/1367-2630/16/12/125006

Results

Characteristics of the network

Nodes: Countries

Edge weight: # of letters
exchanged

	Folder A
N	66
E	294
ρ	0.14
$\langle k \rangle$	8.91
$\langle C \rangle$	0.52
$\langle l \rangle$	2.16
N_c	1
S	1.00
N_{isol}	0
N_{comms}	6
N_{sl}	53

Characteristics of the network

	Folder A
N	66
E	294
ρ	0.14
$\langle k \rangle$	8.91
$\langle C \rangle$	0.52
$\langle l \rangle$	2.16
N_c	1
S	1.00
N_{isol}	0
N_{comms}	6
N_{sl}	53

Community (group) structure

Community (group) structure

$$Q = \frac{1}{2E} \sum_{i,j=1}^N \left[a_{i,j} - \frac{k_i k_j}{2E} \right] \delta(g(i), g(j)) .$$

- M. E. J. Newman, “Modularity and community structure in networks.” Proc. Natl. Acad. Sci. USA, **103**, 8577, (2006). DOI: 10.1073/pnas.0601602103
- V. A. Traag, et al. “From Louvain to Leiden: guaranteeing well-connected communities”. Sci. Rep., **9**, 5233, (2019). DOI:10.1038/s41598-019-41695-z

Community (group) structure

	N_{comms}	Q
Folder A	6	0.053

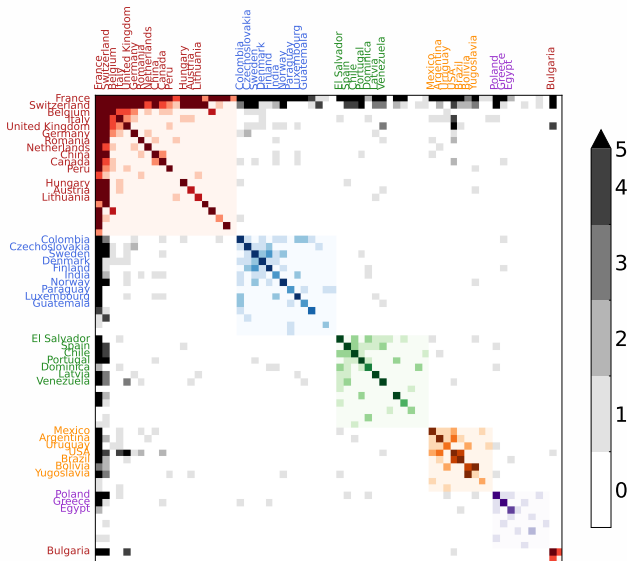
Community (group) structure

	N_{comms}	Q
Folder A	6	0.053

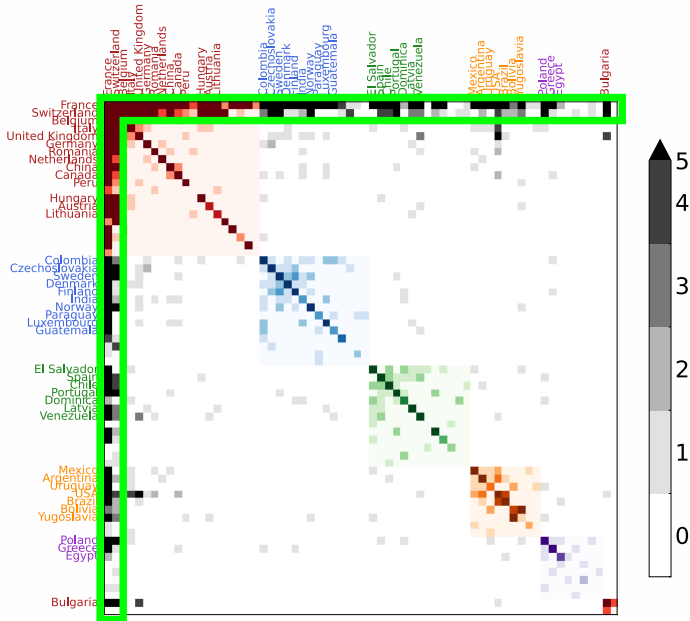
The network **does not** have a community structure!

Community (group) structure

$$Q = 0.053$$

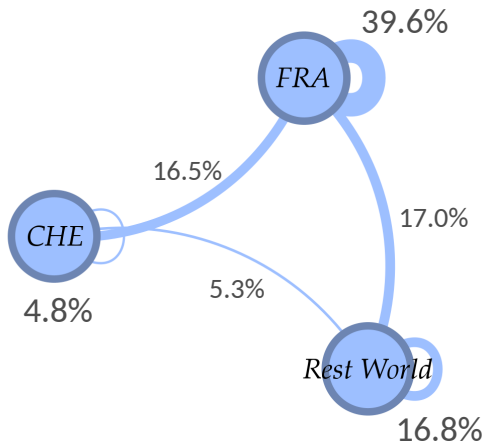


Community (group) structure



Solving the modularity's conundrum

It gets clear that France and Switzerland act as **broadcasters** and behave differently from the rest of the countries!



Solving the modularity's conundrum

Was there intellectual cooperation
beyond that with (and between)
France and Switzerland?

Solving the modularity's conundrum

	N_{comms}	Q
Folder A	6	0.053
Folder A [★]	12	0.444

Solving the modularity's conundrum

	N_{comms}	Q
Folder A	6	0.053
Folder A*	12	0.444

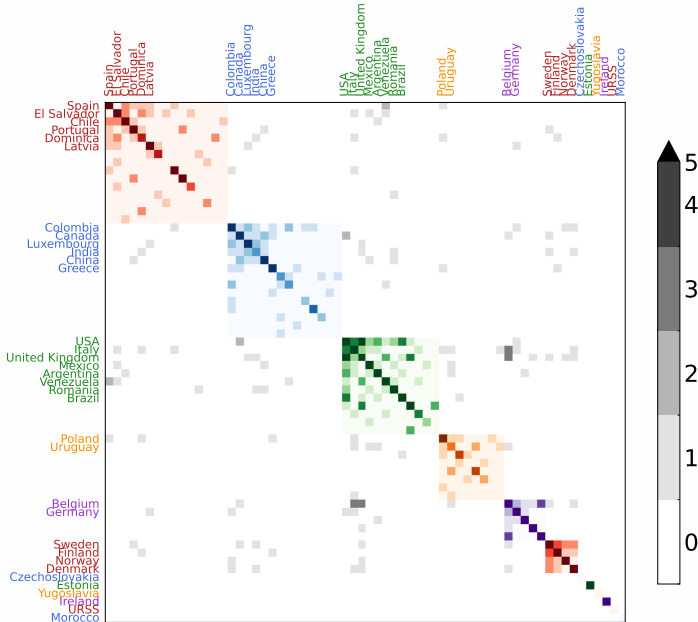
	Folder A	Folder A*
N	66	64
E	294	177
ρ	0.14	0.09
$\langle k \rangle$	8.91	5.53
$\langle C \rangle$	0.52	0.14
$\langle l \rangle$	2.16	3.12
N_c	1	7
S	1.00	0.91
N_{isol}	0	6
N_{comms}	6	12
N_{sl}	53	49

Solving the modularity's conundrum

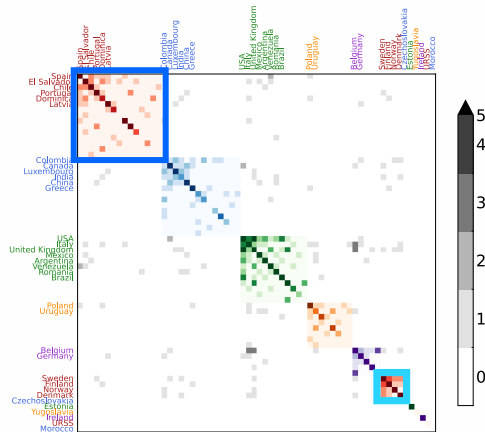
	N_{comms}	Q
Folder A	6	0.053
Folder A*	12	0.444

	Folder A	Folder A*
N	66	64
E	294	177
ρ	0.14	0.09
$\langle k \rangle$	8.91	5.53
$\langle C \rangle$	0.52	0.14
$\langle l \rangle$	2.16	3.12
N_c	1	7
S	1.00	0.91
N_{isol}	0	6
N_{comms}	6	12
N_{sl}	53	49

Solving the modularity's conundrum



Solving the modularity's conundrum



Spain, Portugal, Hungary, Lithuania, Latvia, Chile, El Salvador, Dominican Republic, Dominica, Iran, Palestine, Lebanon, South Africa, Japan, and Thailand.

C1

C2 Canada, Luxembourg, Monaco, **Greece, Albania, Turkey**, Colombia, Paraguay, Guatemala, Panama, Costa Rica, China, India, and Liberia.

C3 **Italy, United Kingdom, United States of America, Austria, Bulgaria, Romania**, Mexico, Argentina, Brazil, Venezuela, Haiti, and Jordan.

C4 Poland, Uruguay, Bolivia, Nicaragua, Ecuador, Egypt, Australia, and Iceland.

C5 **Belgium, Germany, Netherlands**, Peru, and Cuba.

C6 **Sweden, Norway, Denmark, and Finland.**

C7 Czechoslovakia.

C8 Estonia.

C9 Yugoslavia.

C10-11-12 Ireland | URSS | Morocco.

Solving the modularity's conundrum

C1 **Spain, Portugal**, Hungary, Latvia, Lithuania, Chile, El Salvador, Dominican Republic, Dominica, Iran, **Palestine, Lebanon**, **South Africa**, Japan, and Thailand.

C2 Canada, Luxembourg, Monaco, **Greece**, **Albania, Turkey**, Colombia, Paraguay, Guatemala, Panama, Costa Rica, China, India, and Liberia.

C3 **Italy, United Kingdom**, **United States of America, Austria**, **Bulgaria, Romania**, Mexico, Argentina, Brazil, Venezuela, Haiti, and Jordan.

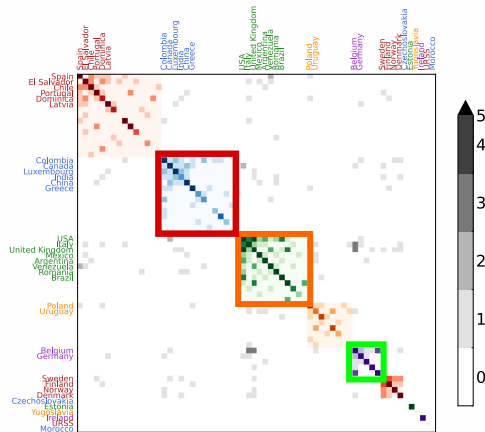
C4 Poland, Uruguay, Bolivia, Nicaragua, Ecuador, Egypt, Australia, and Iceland.

C5 **Belgium, Germany, Netherlands**, Peru, and Cuba.

C6 **Sweden, Norway, Denmark**, and **Finland**.

C7 Czechoslovakia.

C8–12 Estonia | Yugoslavia | Ireland | URSS | Morocco



Cartography

Cartography

Definitions

R1 Peripheral non-hub.

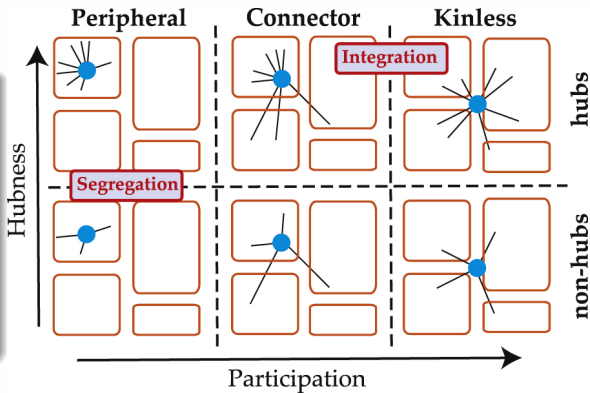
R2 Connector non-hub.

R3 Kinless non-hub.

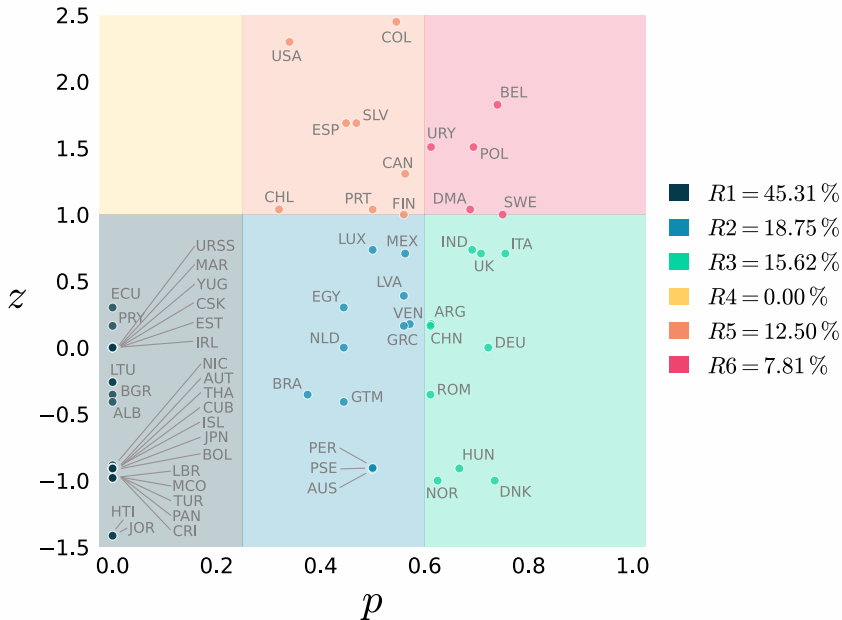
R4 Peripheral hub.

R5 Connector hub.

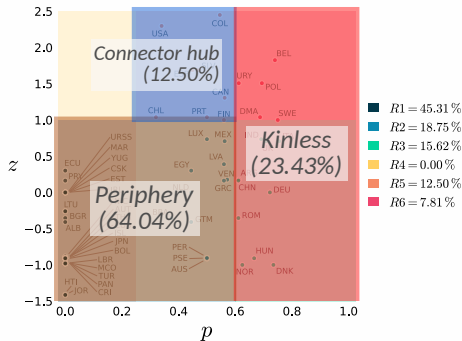
R6 Kinless hub.



Cartography



Cartography



R6 Belgium, Poland, Sweden, Uruguay, and Dominica.

R5 Spain, Portugal, United States of America, Canada, Chile, Colombia, El Salvador, and Finland.

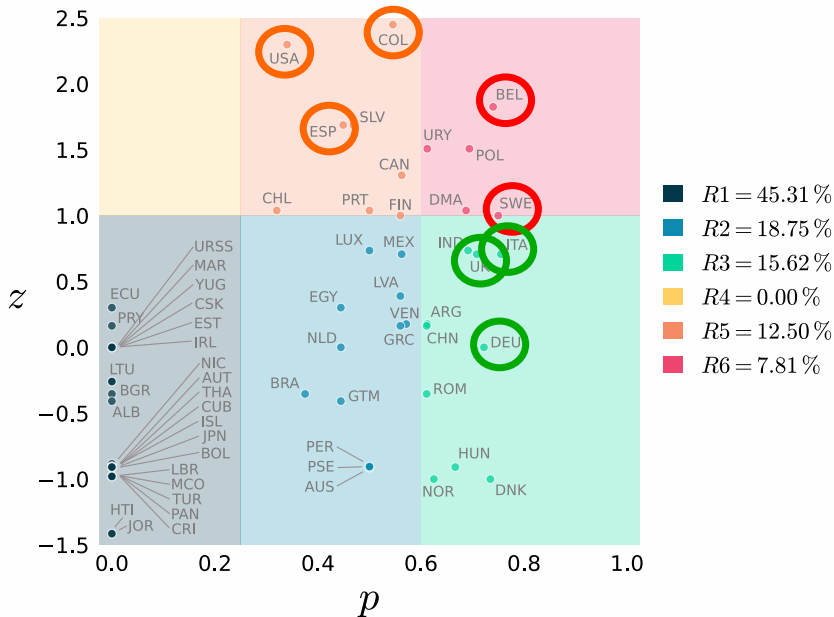
R4 —

R3 Italy, Germany, United Kingdom, Norway, Denmark, Hungary, Romania, Argentina, China, and India.

R2 Latvia, Netherlands, Luxembourg, Greece, Mexico, Brazil, Peru, Venezuela, Guatemala, Egypt, Palestine, and Australia.

R1 Estonia, Lithuania, Austria, Czechoslovakia, Yugoslavia, Albania, Bulgaria, Monaco, Ireland, Iceland, Paraguay, Cuba, Bolivia, Nicaragua, Costa Rica, Ecuador, Haiti, Dominican Republic, Panama, Iran, Turkey, URSS, Morocco, Jordan, Lebanon, South Africa, Liberia, Japan, and Thailand.

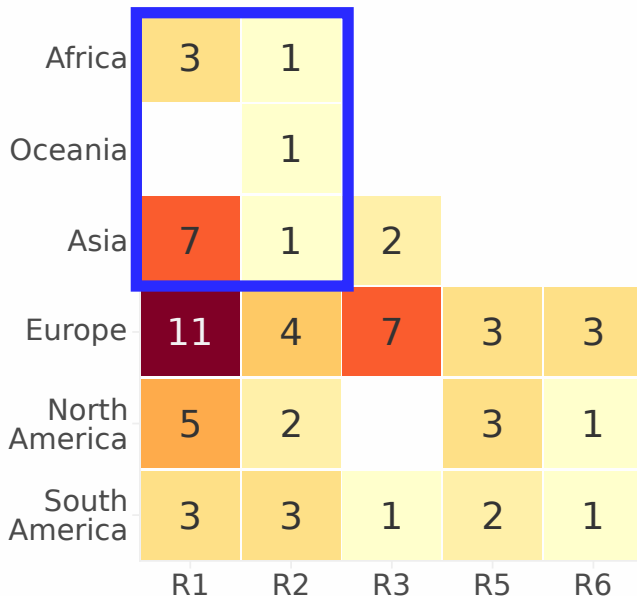
Cartography



Cartography

Africa	3	1			
Oceania		1			
Asia	7	1	2		
Europe	11	4	7	3	3
North America	5	2		3	1
South America	3	3	1	2	1
	R1	R2	R3	R5	R6

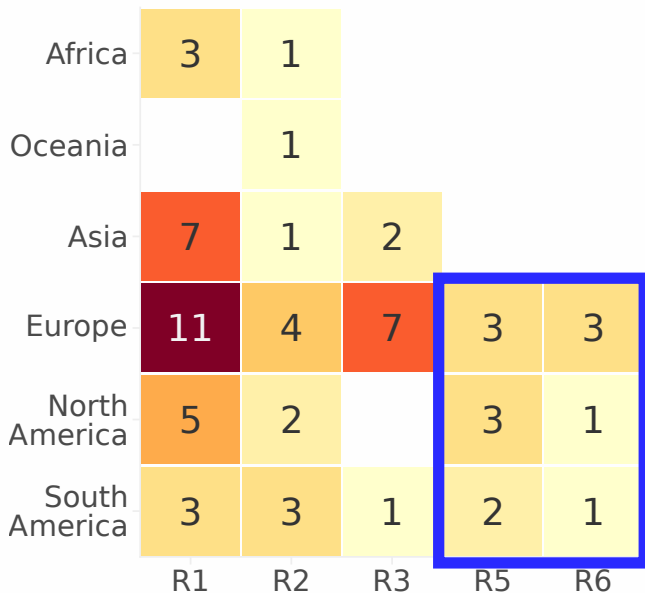
Cartography



Cartography

Africa	3	1			
Oceania		1			
Asia	7	1	2		
Europe	11	4	7	3	3
North America	5	2		3	1
South America	3	3	1	2	1
	R1	R2	R3	R5	R6

Cartography



Conclusions

1942

1942

Monsieur Dominique Vigne
Section des Relations Littéraires
Institut International de Coopération Intellectuelle

Paris
Aménagement
8 Rue de Valenciennes

+

Monsieur,

J'ai bien reçu votre lettre du 15 courant et en réponse je m'empresse de vous assurer que je politiquerai dans le prochain numéro du Siècle des idées libérales un peu plus anti-Française qu'on ne vous l'imaginait. Je vous prie néanmoins, que j'ai eu grand plaisir, pour informer les éditeurs, les lecteurs et l'Institut International de Coopération Intellectuelle de l'existence de la revue, que je faisais connaître, les autres journaux et revues du monde.

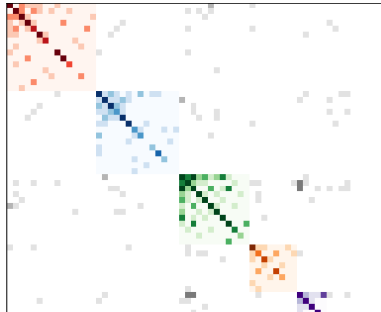
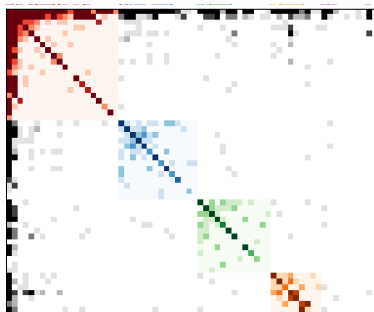
Très cordialement, Monsieur, l'expression de mes sentiments les meilleurs.

Le Secrétaire général
Henri Lamm

1942
Section des Relations littéraires
Institut International de Coopération Intellectuelle

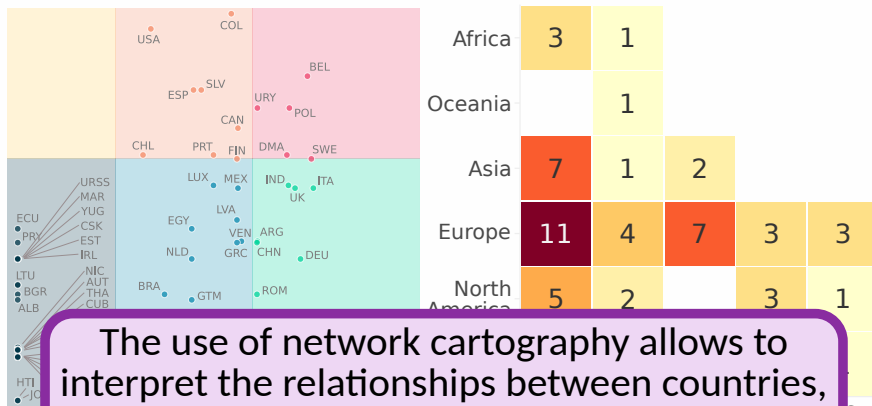
[illegible]

Take Home Messages



The analysis of the network *without broadcasters* highlights the *presence of a non-trivial structure* denoting the existence of intellectual cooperation *beyond* that with France and Switzerland

Take Home Messages



The use of network cartography allows to interpret the relationships between countries, challenging the mainstream vision about the Eurocentric organization of the IIC

Acknowledgements

**Javier
Borge Holthoefer**



**Diana
Roig Sanz**



**Albert
Solé Ribalta**



**Elisabet
Carbó Catalan**



**Rubén
Rodríguez Casañ**



R&I

IN3

Internet
Interdisciplinary
Institute

Acknowledgements



European Research Council
Established by the European Commission

ERC-2018-STG
ID: 803860

@ acardillo@uoc.edu



<https://cardillo.web.bifi.es/>



@a_cardillo

Extra content

Alternative grouping

Question

Can we consider **other types** of groupings?

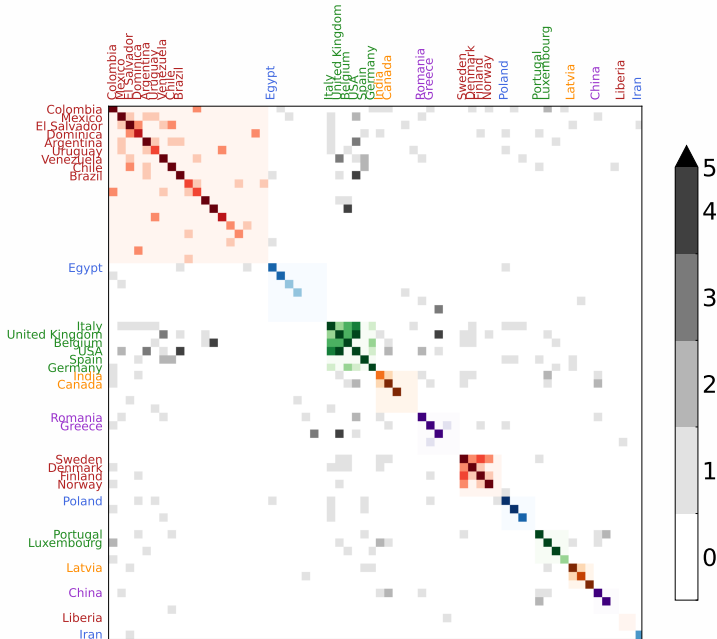
Alternative grouping



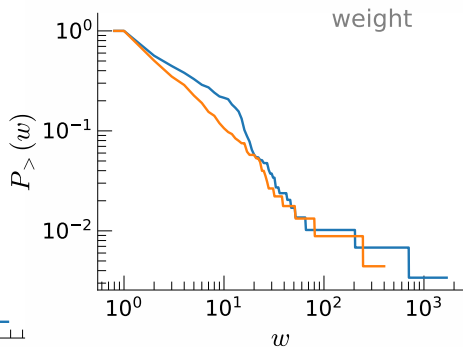
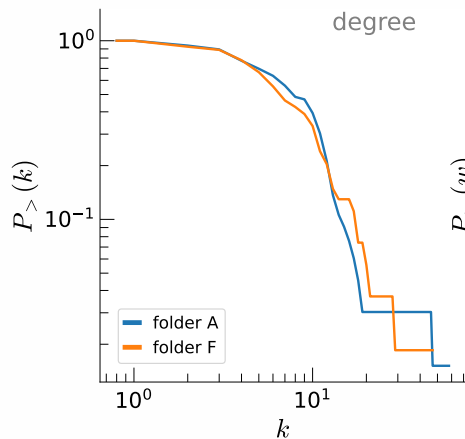
Historical grouping

Group's name	Countries
Big players in IILC	France, United Kingdom, Switzerland, Germany, Italy, Belgium, Spain, and United States of America
EU small countries	Luxembourg, The Netherlands, Portugal, and Monaco
EU central countries	Austria, Czechia, Hungary, and Poland
EU eastern countries	Albania, Bulgaria, Greece, Yugoslavia, and Romania
Baltic countries	Estonia, Latvia, and Lithuania
Nordic countries	Denmark, Finland, Norway, Iceland, and Sweden
Latin countries	Argentina, Bolivia, Brazil, Colombia, Costa Rica, Cuba, Chile, Dominican Republic, Ecuador, Dominica, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Paraguay, El Salvador, Uruguay, and Venezuela
UK's Dominions	Australia, Canada, India, South Africa, and Ireland
Colonies	Egypt, Benin, French Guiana, Haiti, Turkey, Lebanon, Jordan, Morocco, and Palestine
Eastern countries	China, Japan, Cambodia, and Thailand
Middle East	Iran
Other countries	Liberia and URSS

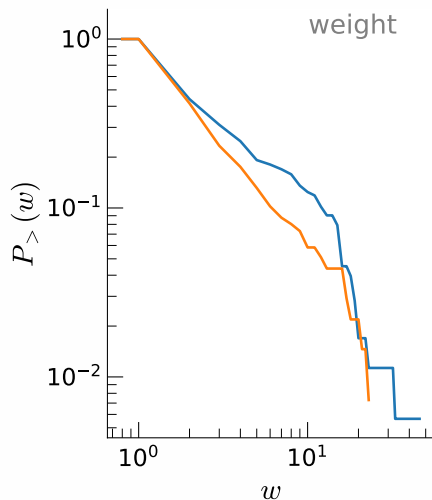
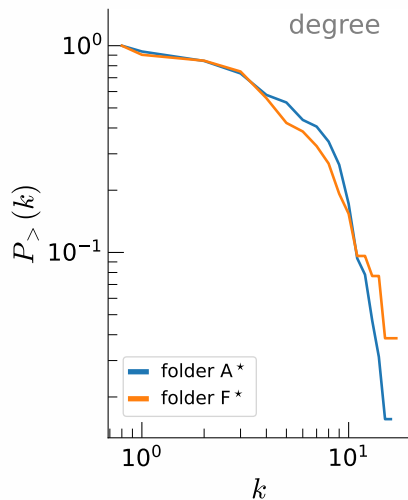
Historical grouping



Cumulative degree and weight distributions



Cumulative degree and weight distributions

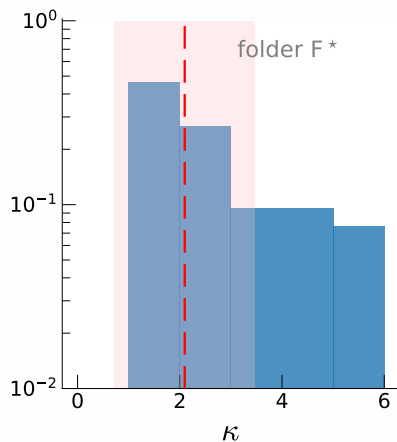
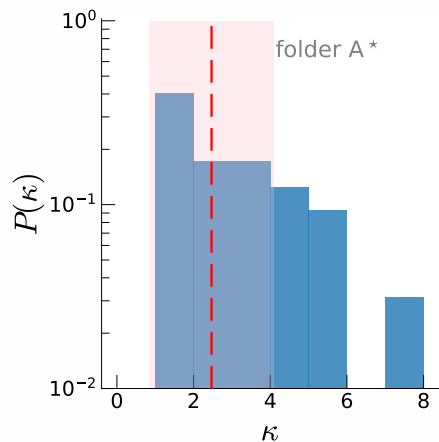


Distribution of within module degree κ

κ_i The degree of node i within its own community/module (we consider also isolated nodes).

$$\kappa_i = \sum_j a_{ij} \delta_{c_i, c_j}$$

Distribution of within module degree κ

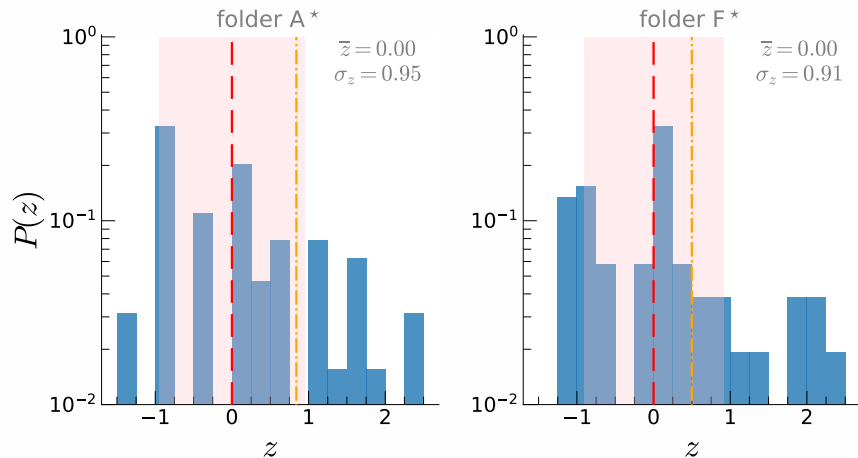


Distribution of κ 's z -score

z -score

$$z_i = \frac{\kappa_i - \overline{\kappa_{C_i}}}{\sigma_{\kappa_{C_i}}}$$

Distribution of κ 's z -score



Note

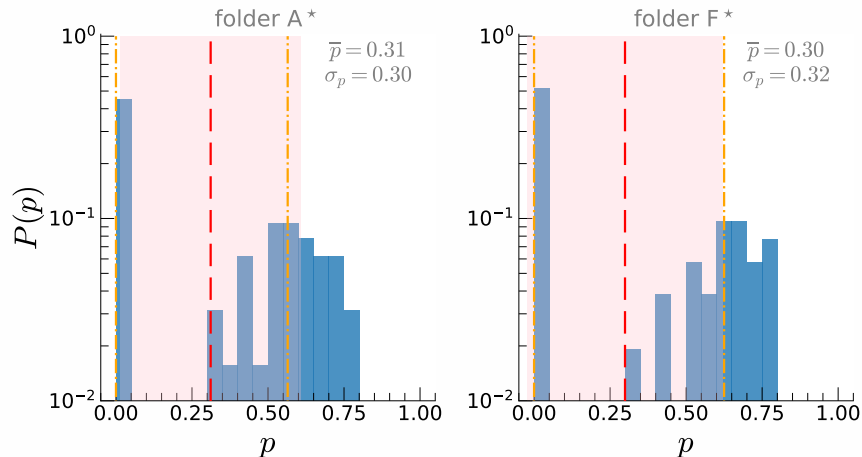
The orange line denotes the 80-th percentile of the distribution

Distribution of participation coefficient p

Participation coefficient, p

$$p_i = 1 - \sum_j^{N_c} \left(\frac{\kappa_i(c_j)}{k_i} \right)^2$$

Distribution of participation coefficient p



Note

The orange lines denote the 25-th and 75-th percentiles of the distribution

Bibliography



J.-J. Renoliet, *L'UNESCO oubliée. La Société des Nations et la coopération intellectuelle (1919–1946)*. (Publications de la Sorbonne, Paris, 1999).



R. Guimerá, and L. A. N. Amaral, “*Functional cartography of complex metabolic networks*”. *Nature*, **433**, 895–900, (2005).
DOI:10.1038/nature03288



F. Klimm, J. Borge-Holthoefer, N. Wessel, J. Kurths, and G. Gorka Zamora-López. “*Individual node’s contribution to the mesoscale of complex networks*”. *New Journal of Physics*, **16**, 125006, (2014).
DOI:10.1088/1367-2630/16/12/125006



V. A. Traag, L. Waltman, and N. J. van Eck, “*From Louvain to Leiden: guaranteeing well-connected communities*”. *Sci. Rep.*, **9**, 5233, (2019).
DOI:10.1038/s41598-019-41695-z



M. Girvan, and M. E. J. Newman, “*Community structure in social and biological networks.*” *Proc. Nat. Acad. Sci. USA*, **99**, 7821, (2002).
DOI:10.1073/pnas.122653799



A. Barrat, M. Barthélemy, R. Pastor-Satorras, and A. Vespignani, “*The architecture of complex weighted networks.*” Proc. Nat. Acad. Sci. USA, **101**, 3747, (2004). DOI: 10.1073/pnas.0400087101



S. Fortunato, and M. E. J. Newman, “*20 years of network community detection.*” Nat. Phys., **18**, 848, (2022). DOI:10.1038/s41567-022-01716-7



S. Fortunato, & D. Hric, “*Community detection in networks: A user guide.*” Phys. Rep., **659**, 1–44, (2016). DOI:10.1016/j.physrep.2016.09.002



J. Bascompte, P. Jordano, C. J. Melián, and J. M. Olesen, “*The nested assembly of plant-animal mutualistic networks.*” Proc. Natl. Acad. Sci. of the USA, **100**, 9383, (2003). DOI:10.1073/pnas.1633576100



A. Solé-Ribalta, C. J. Tessone, M. S. Mariani, and J. Borge-Holthoefer, “*Revealing in-block nestedness: Detection and benchmarking.*” Phys. Rev. E, **97**, 062302, (2018). DOI:10.1103/PhysRevE.97.062302



S. Kojaku, and N. Masuda, “ *Finding multiple core-periphery pairs in networks.*” Phys. Rev. E, **96**, 052313, (2017).

DOI: 10.1103/PhysRevE.96.052313



S. Kojaku, and N. Masuda, “*Core-periphery structure requires something else in the network.*” New Jour. Phys., **20**, 043012, (2018).

DOI: 10.1088/1367-2630/aab547



V. Latora, V. Nicosia, and G. Russo, *Complex Networks.* (Cambridge University Press, Cambridge, UK, 2017). DOI:10.1017/9781316216002