Computation as a quali-quantitative method Investigating IPCC Leadership

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Re-purposing computational methods

from categorization and predictionto hermeneutics and close readingfrom quantitative methodsto quali-quantitative methods

From modelling of collective structures

Règles de la méthode sociologique (E. Durkheim, 1884) The Rules of Sociological Method (1982 translation)

Collective habits are expressed in ... definite forms [which] exist permanently and do not change ... a fixed object, a constant standard which is always to hand for the observer, and which leaves no room for subjective impressions or personal observations (pp. 82-83)

To the mapping of collective dynamics

Monadologie et sociologie (G. Tarde, 1883)

Monadology and Sociology (2012 translation)

The truth is that difference comes about by differing and that change comes about by changing (p. 37)

Les lois de l'imitation (G. Tarde, 1890) The Laws of Imitation (1903 translation)

If Statistics continues to progress... a time may come when upon the accomplishment of every social event, a figure will at once be issued... with precise and condensed knowledge of all the peculiarities of social conditions (p. 133)

Two papers

Venturini, Tommaso, Kari De Pryck, and Robert Ackland. 2021 Bridging in Network Organisations the Case of International Panel on Climate Change Social Networks (forthcoming). Venturini, Tommaso, Tobias Blanke, and Kari De Pryck. 2021 Similarity Sampling by Machine Learning A Social Science Experiment with Artificial Intelligence and IPCC Leadership Working paper.





Why IPCC Leadership?

Intergovernmental Panel on Climate Change

- plays a crucial role in the climate regime, assessing the literature on climate change and providing the bases for the work of the UNFCCC
- through the cohabitation of scientists and diplomats the IPCC has provided a valuable interface between climate science and politics (but it also has been regularly criticised)
- has become a model for other international expert organisations (e.g. IPBES, IPAI)

IPCC Bureau

- The Bureau is composed of about 34 members (the chair and vice-chairs of the IPCC and of its Working Groups and Task Force) elected by the IPCC plenary at the beginning of each assessment cycle
- Bureau membership comes with substantial influence on the work of the IPCC and its bodies (and with considerable prestige for both scientific and diplomatic careers)

The dynamics of organisational elites

Procedures for the election of the IPCC Bureau

Adopted by the Panel at the Twenty-Fifth Session (Mauritius, 26-28 April 2006), amended at the Thirty-Fifth Session (Geneva, 6-9 June 2012), Forty-First Session (Nairobi, 24-27 February 2015)

... the overall composition of the IPCC Bureau ... shall reflect balanced geographical representation with due consideration for scientific and technical requirements (rule 7)

Nominations for positions on the IPCC Bureau and any Task Force Bureau are to be made by the government of a Member of the IPCC. Governments of Members of the IPCC should refrain from nominating non-nationals without the consent of the nominee's national government (rule 19)

The IPCC Dataset

- Developed in two collaboratives projects
 I coordinated (EMAPS and MEDEA)
- Contains the names of all the 5.676 individuals who contributed as author or delegates to the first five IPCC assessment cycles
- Separates the different roles held by the same individual, thus containing about 17.774 rows, corresponding to the contribution by a given individual in a given capacity

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4923	0	2	1	10	AR2 - WG1 - Ch10	AR2-author-WG1	author	invited	CA	2	Abbott M	LISA
2081	0	2	1	2	AD2 WC1 Ch2	AD2 author WC1	author	invited	CA	2	Abbett M	LICA
3081	0	3	1	2	ARS - WGI - CH2	AN3-aution-wol	aution	Invited	CA	2	Abbott, IM.	USA
3080	0	3	1	9	AR3 - WG1 - Ch9	AR3-author-WG1	author	invited	CA	6	Abe-Ouchi, Ayako	Japan
5633	0	5	1	5	AR5 - WG1 - Ch5	AR5-author-WG1	author	selected	LA	6	Abe-Ouchi, Avako	Japan
3088	0	4	2	1	AR4 - WG2 - Ch1	AR4-author-WG2	author	invited	CA	7	Abeku Tarekego	United Kingdom
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3089	0	4	2	8	AR4 - WG2 - Ch8	AR4-author-WG2	author	invited	CA	/	Abeku, Tarekegn	United Kingdom
1430	0	1	1	10	AR1 - WG1 - Ch10	AR1-author-WG1	author	invited	CA	9	Aber, J.	USA
5458	0	1	3	6	AR1 - WG3 - Ch6	AR1-author-WG3	author	selected	CIA	12	Abrol I	India
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4934	U	2	2	23	ARZ - WGZ - Ch23	AR2-author-WG2	author	Invited	LA	12	ADIOI, L.P.	India
3091	0	4	2	6	AR4 - WG2 - Ch6	AR4-author-WG2	author	invited	CA	14	Abuodha, Pamela	Australia
4945	0	2	3	6	AR2 - WG3 - Ch6	AR2-author-WG3	author	selected	LA	15	Achanta, A.N.	India
2002	0	-	2	0	ARA WC2 Cho	AR4 author MG2	author	invited	CA	16	Achard Eródóric	Italu
3092	0	4	3	3	AN4 - WG3 - CI15	AR4-aution-wd3	aution	Invited	CA	10	Actiaid, Fiederic	Italy
3076	0	3	1	5	AR3 - WG1 - Ch5	AR3-author-WG1	author	invited	CA	18	Ackerman, A.	USA
3077	0	3	3	3	AR3 - WG3 - Ch3	AR3-author-WG3	author	invited	CA	19	Ackerman, Frank	USA
3583	0	1	2	2	AB1 - WG2 - Ch2	AR1-author-WG2	author	invited	CA	20	Acock B	LISA
10467	0	1	-	-	ARI - WOZ - CHZ	AN1-aution-woz	delerente	invited.	CA .	20	Acock, D.	Cuba
10467	12	3	none	none	none	AR3-delegate	delegate	deregate		21	Acosta Moreno, Koberto	Cuba
10236	11	2	none	none	none	AR2-delegate	delegate	delegate		21	Acosta Moreno, Roberto	Cuba
4956	0	2	2	11	AR2 - WG2 - Ch11	AR2-author-WG2	author	selected	CLA	21	Acosta Moreno, Roberto	Cuba
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4967	0	2	2	15	AR2 - WG2 - Ch15	AR2-author-wgz	author	selected	LA	21	Acosta Moreno, Roberto	Cuba
5464	0	2	2	SPM	AR2 - WG2 - ChSPM	AR2-author-WG2	author	selected	LA	21	Acosta Moreno, Roberto	Cuba
8459	0	2	SYR	SYR	AR2 - WGnone - ChSYR	AR2-author-SYR	author	selected	LA	21	Acosta Moreno, Roberto	Cuba
7245	0	-	2	14	APS - WG2 - Ch14	APS-author/MG2	author	coloctod	1.4	21	Acosta Moreno, Roberto	Cuba
1243	0	3	3	14	AR5 - WG5 - CH14	AND-dutioi-wd5	aution	selected	LA	21	Acosta Moleno, Roberto	Cuba
3075	0	3	1	5	AR3 - WG1 - Ch5	AR3-author-WG1	author	Invited	CA	22	Adams, P.	USA
3074	0	3	3	2	AR3 - WG3 - Ch2	AR3-author-WG3	author	selected	LA	24	Adegbulugbe, Anthony O.	Nigeria
3094	0	4	3	4	ARA - WG3 - ChA	AR4-author-WG3	author	selected	14	24	Adeshulushe Anthony O	Nigeria
3073	0		2		A02 WC2 Ch1	AD2 author WC3	auth an	selected	14	25	Adelourage, Anthony C.	Aligeria
3073	0	3	2	1	AR5 - WG2 - Ch1	AR3-author-wG2	author	selected	LA	25	Adejuwon, James O.	Nigena
8308	0	2	none	none	AR2 - WGnone - Chnor	AR2-bureau	bureau	bureauAR2	ional representa	25	Adejuwon, James O.	Nigeria
3095	0	4	2	9	AR4 - WG2 - Ch9	AR4-author-WG2	author	invited	CA	26	Adesina, Francis	Nigeria
4079	0		2	0	AB2 WC2 Ch0	AB2 author WC2	outhor	invited	CA	27	Adapt M Mail	United Kingdom
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3071	0	3	2	11	AR3 - WG2 - Ch11	AR3-author-WG2	author	selected	LA	27	Adger, W. Neil	United Kingdom
3072	0	3	2	18	AR3 - WG2 - Ch18	AR3-author-WG2	author	invited	CA	27	Adger, W. Neil	United Kingdom
2006	0	4	2	17	ARA MICO Ch17	AR4 author M/C2	author	coloctod	CLA	27	Adger W/ Noil	United Kingdom
3090	0	4	2	17	AR4 - WGZ - CH17	AR4-dutioi-wogz	aution	selected	CDA	27	Auger, w. weit	Onited Kingdom
3097	0	4	2	SPM	AK4 - WG2 - ChSPM	AK4-author-WG2	author	selected	LA	27	Adger, W. Nell	United Kingdom
3098	0	4	2	TS	AR4 - WG2 - ChTS	AR4-author-WG2	author	selected	LA	27	Adger, W. Neil	United Kingdom
7967	0	5	2	12	AR5 - WG2 - Ch12	AR5-author-WG2	author	selected	CIA	27	Adger W Neil	United Kingdom
7000	0	5	-	TC	ADS WOL CHILL	ADS author WG2	author .	Sciected	14	27	Adam Mr. Nell	United Kingdom
7968	U	5	2	15	AR5 - WG2 - Chis	AR5-author-WG2	author	selected	LA	27	Adger, W. Nell	United Kingdom
8383	0	5	2	SPM	AR5 - WG2 - ChSPM	AR5-author-WG2	author	selected	LA	27	Adger, Neil	United Kingdom
9227	5	1	none	none	none	AR1-delegate	delegate	delegate		28	Adhikary, S.	Nepal
9090	4	1			0000	AP1 delegate	delegate	delegate		20	Adhikanı Sharad D	Nonal
0909	4	-	none	none	none	ANT-Gelegate	ueregate	uelegate		20	Autitikaly, Sitalau P	мера
5436	0	1	3	6	AR1 - WG3 - Ch6	AR1-author-WG3	author	selected	LA	28	Adhikary, Sharad P.	Nepal
4989	0	2	2	5	AR2 - WG2 - Ch5	AR2-author-WG2	author	selected	LA	28	Adhikary, Sharad P.	Nepal
5000	0	2	2	TS	AB2 - WG2 - ChTS	AR2-author-WG2	author	betralez	14	28	Adhikary Sharad P	Nenal
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5598	U	2	2	SPIM	ARZ - WGZ - ChSPIM	AR2-author-WG2	author	selected	LA	28	Adhikary, Sharad P.	Nepai
3070	0	3	2	11	AR3 - WG2 - Ch11	AR3-author-WG2	author	selected	LA	28	Adhikary, Sharad P.	Nepal
10167	11	2	none	none	none	AR2-delegate	delegate	delegate		29	Adler, Serena	Romania
2000	0	-	1	2	ADA MICI Cho	ARA author MC1	author	insited	CA	20	Adler Robert F	LICA
3099	0	4	1	3	AN4 - WOI - CIIS	AR4-aution-wor	aution	Invited	CA	2.5	Aulei, Robert F.	USA
261	0	5	1	2	AR5 - WG1 - Ch2	AR5-author-WG1	author	invited	CA	29	Adler, Robert F.	USA
5011	0	2	2	27	AR2 - WG2 - Ch27	AR2-author-WG2	author	selected	LA	30	Adler, Michael	USA
5023	0	2	2	TS	AR2 - WG2 - ChTS	AR2-author-WG2	author	selected	IΔ	30	Adler Michael	LISA
5465	0	-	-	0014	ADD INCO CLODA		addior	Sciected		30	Aller Michael	USA
5465	U	2	2	SPM	AR2 - WG2 - ChSPIM	AR2-author-WG2	author	selected	LA	30	Adler, Michael	USA
3100	0	4	2	16	AR4 - WG2 - Ch16	AR4-author-WG2	author	selected	LA	31	Agard, John	Trinidad and Tobago
7230	0	5	2	29	AR5 - WG2 - Ch29	AR5-author-WG2	author	selected	LA	31	Agard, John	Trinidad and Tobago
12006	20	4			POPO	ADA delegate	delerate	delegate		22	Aganual Chri Catich	India
13990	20	4	none	none	none	AR4-delegate	ueregate	ueregate		32	Agarwar, Sini Saush	Inuia
3069	0	3	3	1	AR3 - WG3 - Ch1	AR3-author-WG3	author	invited	CA	32	Agarwal, Anil	India
3102	0	4	2	5	AR4 - WG2 - Ch5	AR4-author-WG2	author	selected	CLA	33	Aggarwal, Pramod	India
2102	0	4	2	CDM	ARA MICO CHERMA	AR4 author MG2	author	related	1.4	22	Agganual Promod	India
3103	0	4	2	JF IVI	AR4 - WG2 - CH3P W	AR4-aution-woz	aution	Selected		33	Aggaiwai, Flainou	India
3104	0	4	2	TS	AR4 - WG2 - ChTS	AR4-author-WG2	author	selected	LA	33	Aggarwal, Pramod	India
7005	0	5	2	7	AR5 - WG2 - Ch7	AR5-author-WG2	author	selected	RE	33	Aggarwal, Pramod	India
3105	0	4	2	7	AR4 - WG2 - Ch7	AR4-author-WG2	author	invited	CA	34	Agnew, Maureen	United Kingdom
2106	0		2	9	APA - WG2 - Ch9	ARA-author W/C2	author	invited	CA	35	Agoli-Agbo, Micheline	Renin
5100	0	4	2		AR4 - WG2 - CI19	AR4-dutioi-wdz	aution	Invited	CA	33	Agon-Agoo, Michenne	benni
9959	10	2	none	none	none	AR2-delegate	delegate	delegate		37	Agrawala, Shardul	USA
5034	0	2	2	25	AR2 - WG2 - Ch25	AR2-author-WG2	author	selected	LA	37	Agrawala, Shardul	India
5045	0	2	2	TS	AR2 - WG2 - ChTS	AR2-author-WG2	author	selected	LA	37	Agrawala, Shardul	India
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5466	U	2	2	SPM	ARZ - WGZ - CDSPM	Anz-autnor-WG2	author	selected	LA	37	Agrawala, Shardul	india
3107	0	4	2	17	AR4 - WG2 - Ch17	AR4-author-WG2	author	selected	CLA	37	Agrawala, Shardul	France
3108	0	4	2	SPM	AR4 - WG2 - ChSPM	AR4-author-WG2	author	selected	LA	37	Agrawala, Shardul	France
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5109	U	4	2	13	MM4 - W02 - CIIIS	Ante-dution-w/GZ	aution	selected	LA	57	ngrawara, siraruur	riance
7250	0	5	3	14	AR5 - WG3 - Ch14	AR5-author-WG3	author	selected	CLA	37	Agrawala, Shardul	France
7251	0	5	3	SPM	AR5 - WG3 - ChSPM	AR5-author-WG3	author	selected	LA	37	Agrawala, Shardul	France
7252	0	5	3	TS	AR5 - WG3 - ChTS	AR5-author-W/C2	author	salartari	14	37	Agrawala Shardul	France
1232	0	5	3	13		And dution was	aution	scieuteu	UA	37	ngruwara, siraruur	i mille
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17329	41	5	none	none	none	AR5-delegate	delegate	delegate		38	Agricole, Will	Seychelles
17051	40	5	none	none	none	AR5-delegate	delegate	delegate		38	Agricole, Will	Sevchelles
16404	20	5		none		ADE delegate	delegate	delegate	-	20	Agricolo 1861	Serveh all as
10484	38	5	none	none	none	Ano-delegate	deregate	delegate		38	Agricole, Will	seycheries
16075	36	5	none	none	none	AR5-delegate	delegate	delegate		38	Agricole, Will	Seychelles
12919	24	4	none	none	none	AR4-delegate	delegate	delegate		38	Agricole, Will	Sevchelles
2110	0		2	16	ABA WG2 Ch1C	ARA author WC2	outhor	invited	CA	29	Agricolo Will	Southollor
3110	U	4	2	10	AN4 - WGZ - CH16	An++-author-wG2	author	invited	CA	38	Agricole, will	seycheries
3110	0	4	2	16	AK4 - WG2 - Ch16	AK4-author-WG2	author	invited	CA	38	Agricole, Will	seychelles
14192	29	5	none	none	none	AR5-delegate	delegate	delegate		38	Agricole, Will	Sevchelles
10940	14	3	none	none	none	AR3-delegate	delegate	delegate		39	Aguilar lyette De	El Salvador
10540	14	2	2	12	ADD WCD Ch12	ADD author W/CD	author	celested	1.4	30	Amilas Adrias Cuille	Marian
5053	U	2	2	12	ARZ - WGZ - Ch12	MRZ-author-WG2	author	selected	LA	39	Aguilar, Adnan Guillermo	IVIEXICO
5054	0	2	2	TS	AR2 - WG2 - ChTS	AR2-author-WG2	author	selected	LA	39	Aguilar, Adrian Guillermo	Mexico
5469	0	2	2	SPM	AR2 - WG2 - ChSPM	AR2-author-WG2	author	selected	LA	39	Aguilar, Adrian Guillermo	Mexico
2067	0	-	1	1	AP2 W/C1 Ch1	AP2 author WC1	author	colocted	14	41	Ablancou, Epiphana Poteri	Bonin
5007	U	3	T	1	WU2 - MOT - CUT	Ano-author-WG1	author	selected	LA	41	Amonsou, Epiphane Dotou	beilh
15595	33	5	none	none	none	ar5-delegate	delegate	delegate		41	Ahlonsou, Epiphane	Benin
15315	32	5	none	none	none	ar5-delegate	delegate	delegate		41	Ahlonsou, Epiphane	Benin
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Workstreams

Turnetional d	liviciono		Temporal divisions						
Functional d	nvisions		AR1	AR2	AR3	AR4	AR5		
Delegates			ar1-delegate	ar2-delegate ar3-delegate		ar4-delegate ar5-delega			
		WGI	arl-author-wgl	ar2-author-wg1	ar3-author-wg1	ar4-author-wg1	ar5-author-wg1		
Anthony	Thematic	WGII	ar1-author-wg2	ar2-author-wg2	ar3-author-wg2	ar4-author-wg2	ar5-author-wg2		
Autnors	divisions	WGIII	ar1-author-wg3	ar2-author-wg3	ar3-author-wg3	ar4-author-wg3	ar5-author-wg3		
		SYR	/	ar2-author-syr	ar3-author-syr	ar4-author-syr	ar5-author-syr		

Bipartite network of workstream & contributors



Degree



Betweeness Centrality

BC is calculated for a node *i* by first finding the shortest paths between all other pairs of nodes in the network, and then summing up the proportion of those paths that passes through node *i*

"when a person is strategically located on the communication paths..., that person... can influence the group by information withholding or distorting in transmission" Freeman, L. C. 1979. "Centrality in Social Networks." *Social Networks* 1 (3): 215–39

Jaccard Bridgeness

"bipartite-bridgeness" is defined as the summation of the number of connections created by a node, weighted by their importance and rarity

$$BB(n) = \sum_{i,j} \frac{neighbors(i) \cup neighbors(j)}{neighbors(i) \cap neighbors(j)} \quad \text{importance}_{rarity}$$

 $BB(n) = \sum_{ij}$

union of the neighbourhoods of i&j intersection of the neighbourhoods of i&j

As the intersection of two sets divided by their union is their Jaccard coefficient, the bipartite-bridgeness of 'n' can be defined as the summation of the inverse Jaccard coefficient of the neighbourhoods of all couple of neighbours of 'n'

Jaccard Bridgeness

BB(n) =

ar5-author-wg ar4-author-wg1 ar1-author-wg1 ar2-author-wg1 ar5-author-wg ar5-author-sy ar3-author-wg1 ar4-autho ar4-author-syr ar3

union of the neighbourhoods of i&j intersection of the neighbourhoods of i&j



A test based on IPCC Bureau



Decomposing the jaccard bridgeness



Functional bridgeness

being affiliated to workstreams of different functions during the same AR

Thematic bridgeness

being affiliated to workstreams of different WGs during the same AR

Temporal bridgeness

being affiliated to workstreams of the same function and of the same WG during different ARs

Top bridges by type

	top-20 degree bridges	top-20 between. bridges	top-20 2-step bet. bridges	top-20 Jaccard bridges	top-20 Jaccard bridges (thematic)	top-20 Jaccard bridges (functional)	top-20 Jaccard bridges (temporal)
1	Watson, R.	Zillman, J. W.	Christ, R.	Watson, R.	Harvey, D.	Qin, Dahe	Zillman, J.W.
2	Qin, Dahe	Ding, Yihui	Pachauri, R.	Zillman, J. W.	Van Vuuren, D.P.	Pachauri, R.	Abuleif, K.M.
3	Pachauri, R.	Abuleif, K.M.	Tirpak, D.	Qin, Dahe	Grubb, M.	Pichs Madruga, R.	Clini, C.
4	Houghton, J.	Clini, C.	Parry, M.	Harvey, D.	House, J. I.	Watson, R.	Jorgensen, A.M.
5	Zillman, J. W.	Jorgensen, A.M.	Vellinga, P.	Pachauri, R.	Fuglestvedt, J.	Canziani, O.	Penman, J.M.
6	Parry, M.	Penman, J.M.	Watson, R.	Houghton, J.	Kheshgi, H.S.	Davidson, O.	Izrael, J. A.
7	Vellinga, P.	Izrael, J. A.	Lee, Hoesung	Grubb, M.	Toth, F.L.	Houghton, J.	Majeed, A.
8	Bolin, B.	Majeed, A.	Houghton, J.	Parry, M.	Watson, R.	Van Ypersele, J.P.	Zatari, T. M.
9	Davidson, O.	Wratt, D.	Grubb, M.	Vellinga, P.	Richels, R.	El Gizouli, I.A.	Bodin, S.
10	Canziani, O.	Watson, R.	Lin, Erda	Bolin, B.	Houghton, R.A.	Edenhofer, O.	Miotke, J.A.
11	Cramer, W.	Petit, M.	Wratt, D.	Davidson, O.	Rasch, P.	Cramer, W.	Teuatabo, N.
12	Field, C.	Pachauri, R.	Hourcade, C.	Canziani, O.	Smith, S.J.	Parry, M.	Vellinga, P.
13	Richels, R.	Lin, Erda	Harvey, D.	Abuleif, K.M.	Minx, J.C.	Manning, M.	Watson, R.
14	Fitzharris, B.	Bolin, B.	Sokona, Y.	Clini, C.	Seyboth, K.	Field, Chris	Houghton, J.
15	Marengo, J.	Cramer, W.	Oppenheimer, M.	Jorgensen, A.M.	Bolin, B.	Friedlingstein, P.	Lee, Hoesung
16	Mearns, L.	Sharma, S.	Field, C.	Penman, J.M.	Scholes, R.J.	Metz, Bert	Ding, Yihui
17	Lin, Erda	Zatari, T. M.	Davidson, O.	Izrael, Y.	Vellinga, P.	Barros, V.	Tirpak, D.
18	(27 ex aequo)	Hourcade, C.	Richels, R.	Majeed, A.	Jefferson, M.	Lee, Hoesung	Andrasko, K.
19	(27 ex aequo)	Jallow, B. P.	Qin, Dahe	Lee, Hoesung	Davidson, O.	Sokona, Y.	Kobayashi, K.
20	(27 ex aequo)	Semenov, S.	Pittock, A.B.	Pichs Madruga, R.	Marengo, J. Mearns, L.	Stocker, T.	Bolin, B. Meira Filho, G.

Featurisation

Individual trajectory features

Bridgeness

- Last AR when active
- Directly from 2. Number of plenary sessions the database 3. Number of chapter signed

 - Has been CLA, SPM, SYR, or Bureau

 - 5.Degree6.Temporal bridgeness7.Thematic bridgeness8.Functional bridgeness9.Total bridgeness

Centrality (monopartite)

- 10. Betweeness centrality
- 11. Closeness centrality
 12. Eigen-centrality

National affiliation features

- 13. Number of authors by the country
- 14. Number of delegates by the country
- 15. Financial contribution to the IPCC
- 16. GDP per Capita
- 17. % of GDP dedicated to R&D
- 18. Scientific and technical articles
- 19. CO2 equivalent emissions

Features comparison



148 individuals nominated for the IPCC Bureau

Feature	difference	non-bureau average rank	bureau average rank	
BR-BridgeSum	3362	5914	2552	
NET-Degree	3355	5914	2559	
ENG-LastActive	2766	5906	3140	
ENG-CountSignatures	2652	5905	3253	
ENG-SpmSyrBureauCla	2605	5904	3300	
NET-PersonBet	2595	5904	3309	
BR-Functional	2550	5904	3354	
BR-Temporal	2310	5901	3591	
ENG-CountSessions	2096	5898	3802	
BR-Thematic	890	5883	4993	
NAT-Authors	-40	5870	5910	
NET-Closeness	-44	5871	5915	
NAT-Delegates	-326	5866	6193	
NAT-Emissions	-360	5800	6160	
NAT-Articles	-489	5818	6307	
NAT-GdpCapita	-581	5766	6348	
NAT-GdpR&D	-588	5350	5938	
NAT-Contribution	-614	5864	6478	
NET-PersonEig	-976	5859	6835	

Escaping the "accuracy paradox"

Out of a total of 11.742 rows in our sub-set of training data

only 148 or 1.3% rows correspond to candidate or elected Bureau

A model predicting 0 candidate or elected Bureau

Would be 98.7% accurate

Anomalies detection



Isolation Forest (mean distance from root)





Liu, Fei Tony, Kai Ming Ting, and Zhi-Hua Zhou. 2008. "Isolation Forest." In 2008 *Eighth IEEE International Conference on Data Min*ing, IEEE, 413–22. http://docs.h2o.ai/h2o/latest-stable/h2o-docs/data-science/if.html?highlight=isolation%20forest

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Feature	difference	non-bureau average rank	bureau average rank	
MeanLength	<mark>5.554</mark>	5942	387	
BR-BridgeSum	3.362	5914	2552	
NET-Degree	3.355	5914	2559	
ENG-LastActive	2.766	5906	3140	
ENG- CountSignatures	2.652	5905	3253	
ENG- SpmSyrBureauCla	2.605	5904	3300	
NET-PersonBet	2.595	5904	3309	
BR-Functional	2.550	5904	3354	
BR-Temporal	2.310	5901	3591	
ENG-CountSessions	2.096	5898	3802	
BR-Thematic	890	5883	4993	
NAT-Authors	-40	5870	5910	
NET-Closeness	-44	5871	5915	
NAT-Delegates	-326	5866	6193	
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NAT-Contribution	-614	5864	6478	
NET-PersonEig	-976	5859	6835	

Exploiting the non-deterministic nature of isolation forests



Top 20 most similar to Bureau members

		Ran_LS	NET Degree	BR Temporal	BT Thematic	BR Function	BR Sum	ENG Sessions	ENG Signatur.	ENG- ClaSpmSyrBureau
Cramer, Wolfgang P.	Germany	120	7	816	194	2061	3071	3	14	3
Ishitani, Hisashi	Japan	137	3	0	0	236	236	1	5	2
Jorgensen, Anne Mettek	Denmark	138	5	3824	0	0	3824	25	0	0
Mostefa-Kara, M.K.	Algeria	141	2	0	0	1523	1523	2	1	1
Kashiwagi, Takao	Japan	146	3	0	0	236	236	1	4	2
Friedlingstein, Pierre	France	156	5	121	228	2485	2834	3	9	2
Titus, J.	USA	164	2	0	307	0	307	0	2	1
Melillo, Jerry	USA	165	4	61	173	0	234	1	5	2
Oquist, Mats	Sweden	166	2	71	0	0	71	0	4	2
Perrin, Dominique	Belgium	168	3	878	0	0	878	4	0	0
Clini, Corrado	Italy	171	5	3824	0	0	3824	6	0	0
Taniguchi, Tomihori	Japan	172	3	0	143	1140	1283	3	3	1
Melnikov, P.I.	USSR	174	1	0	0	0	0	0	1	1
Morand Francis, Pascale	Switzerland	176	3	84	0	310	394	6	1	0
Ososkova, Tatyana	Uzbekistan	178	5	1271	0	255	1526	15	1	0
Brown, Sandra	USA	186	2	71	0	0	71	0	8	2
Kerem, A.	Israel	191,5	1	0	0	0	0	1	0	0
Morgenstern, Richard	Germany	194	2	1485	0	0	1485	6	0	0
Mahrenholz, R.	Germany	197	3	878	0	0	878	3	0	0
Banuri, Tariq	USA	200	4	97	122	1046	1265	1	5	3

Conclusions

Computational techniques

- can be used not only to automate tasks but also to kindle sociological imagination
- not only ways to handle large datasets *but also* as tools for qualitative investigation
- are not infallible *yet* errors of model can be sources of insights



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