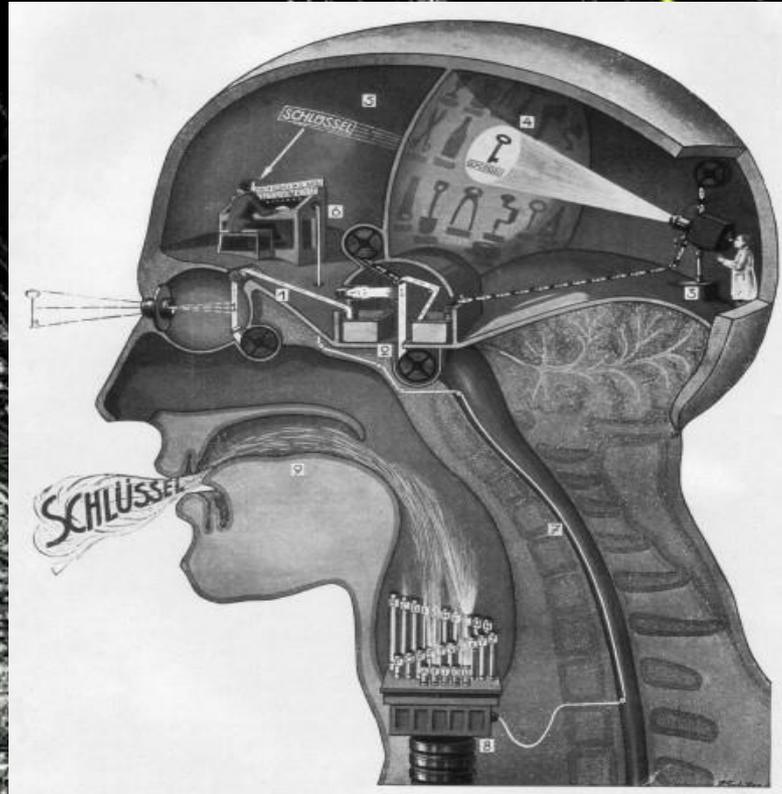


International Conference

Multidisciplinary Perspectives on Algorithms: Regulation, Governance, Markets

November 21 -23, 2019, Kyushu University (Fukuoka, JAPAN)



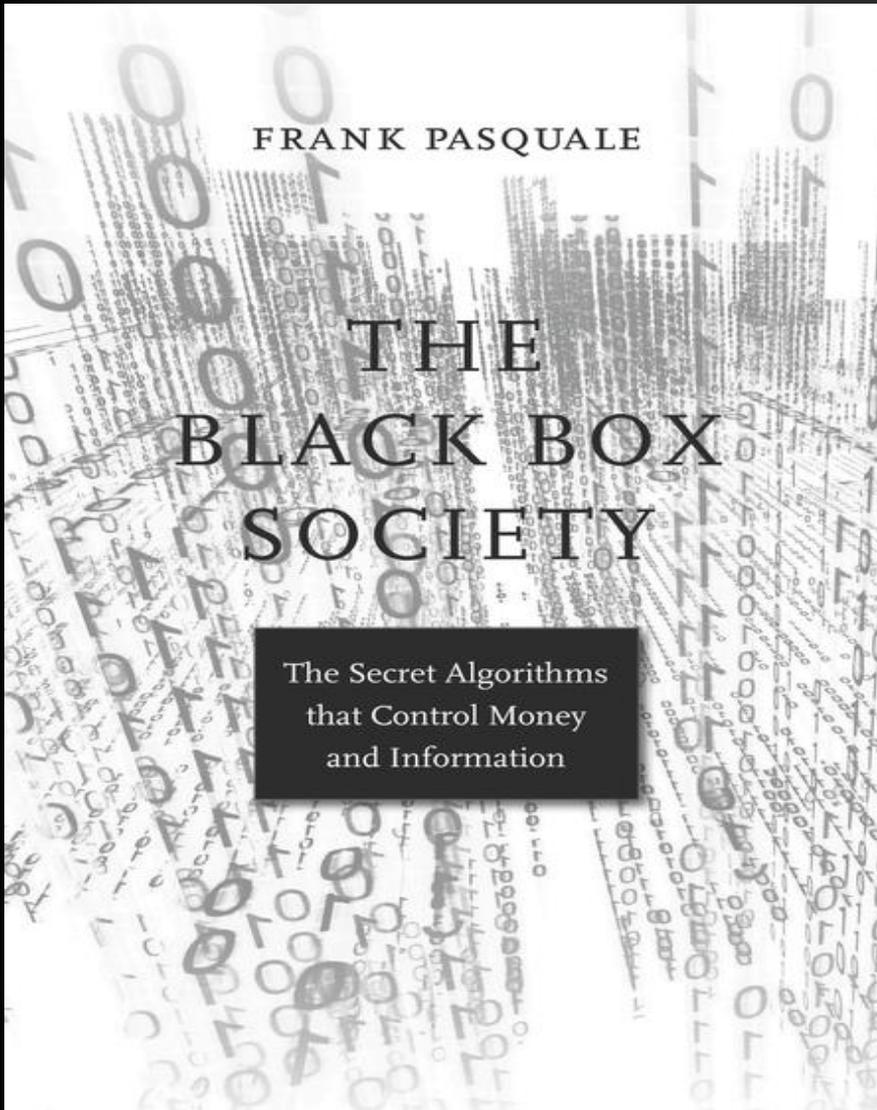
Law, Mind and Machine: Which Logic?

Rostam Joseph NEUWIRTH

Mag. iur. (Graz) LL.M. (McGill), Ph.D. (EUI, Florence)

Professor of Law / Head of Department for Global Legal Studies

Two Black Boxes: The Mind & The Machine



Prying Open the Black Box of the Brain

NSF-funded workshop addresses brain structure and function



How does the brain record, process, use, store and retrieve vast quantities of information?

[Credit and Larger Version](#)

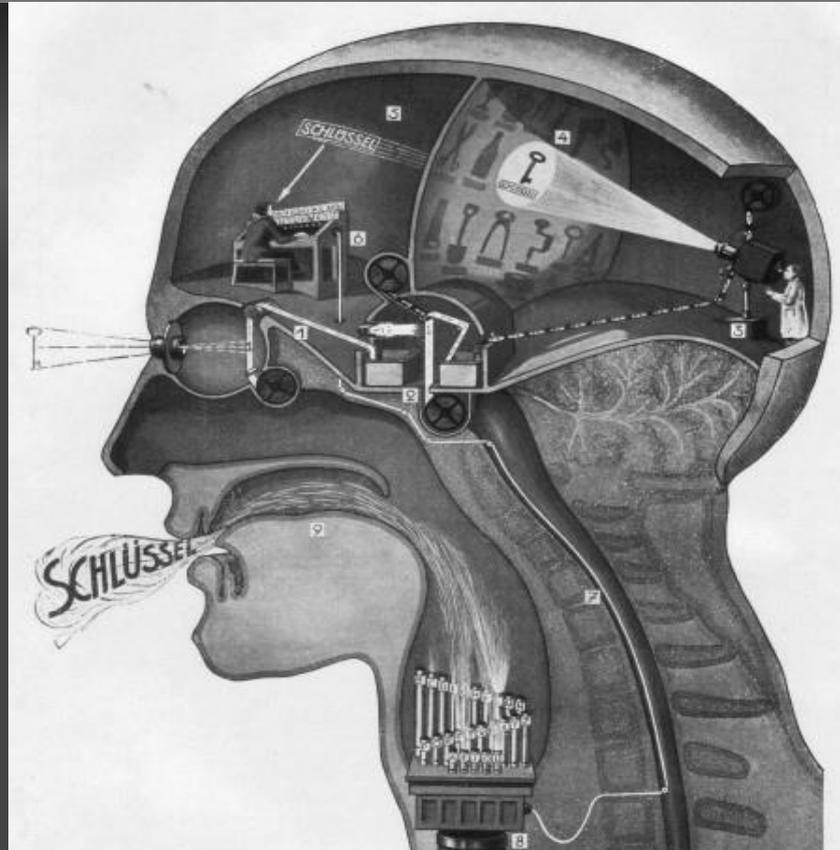
June 12, 2013

The human brain is the most complex biological structure on Earth. It has about 100 billion neurons—each of which has thousands of connections to other neurons.

• Frank Pasquale, *The Black Box Society: The Secret Algorithms That Control Money and Information* (Harvard University Press, Cambridge (Mass), 2015).

• "Prying open the Black Box of the Brain", https://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=128239

Two Gateways to the Human Mind: **Technology and Language**



“From the ‘camera obscura’ through the ‘cinematograph’ and now the computer, new technologies have provided metaphors for understanding how the mind works.”

Two Gateways to the Human Mind: Technology and Language

Technology & Language

From around 1880 to the outbreak of World War I a series of sweeping changes in technology and culture created distinctive new modes of thinking about and experiencing time and space. Technological innovations including the telephone, wireless telegraph, x-ray, cinema, bicycle, automobile, and airplane established the material foundation for this reorientation; independent cultural developments such as the stream-of-consciousness novel, psychoanalysis, Cubism, and the theory of relativity shaped consciousness directly.

Two Gateways to the Human Mind: Technology and Language

Metaphor is for most people a device of the poetic imagination and the rhetorical flourish—a matter of extraordinary rather than ordinary language.

Moreover, metaphor is typically viewed as characteristic of language alone, a matter of words rather than thought or action. For this reason, most people think they can get along perfectly well without metaphor.

We have found, on the contrary, that **metaphor is pervasive in everyday life, not just in language but in thought and action.**

Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature. The concepts that govern our thought are not just matters of the intellect. They also govern our everyday functioning, down to the most mundane details. Our concepts structure what we perceive, how we get around in the world, and how we relate to other people.

Our conceptual system thus plays a central role in defining our everyday realities.

Two Gateways to the Human Mind: Technology and Language

Google Books Ngram Viewer

Graph these comma-separated phrases: case-insensitive
between and from the corpus with smoothing of [Search lots of books](#)



(click on line/label for focus)

THE RISE OF THE OXYMORON

Law, Mind and Machine: Which Logic?

art

essentially oxymoronic concepts: *examples*

science

HONORABLE	VILLAIN
PIANO	FORTE
TRUE	LIES

CONSTANT	CHANGE
SPACE	TIME
BLACK	LIGHT

law

INTELLECTUAL	PROPERTY
LENGTHY	BRIEFS
SOFT	LAW

economics

CREATIVE	ECONOMY
CO-O	PETITION
PRO	SUMER

politics

GLO	CALISATION
UNITED	NATIONS
SUSTAINABLE	DEVELOPMENT

essentially oxymoronic concepts: *examples*

Frappuccino



Hate-love



Conchita Wurst



Sports Utility Vehicle (SUV)

**GLOCALISATION
FRAGMEGRATION
COOPETITION**

Pure	Law
Soft	Law
Global	Justice (Lawyer)
Restorative	Justice
Legal	Fiction
Wrongful	Life
Culture	Industry
Intellectual	Property
Aesthetic	Functionality
Old	News
Porn Star's	Privacy
Multilateralizing (Regionalizing)	Regionalism (Multilateralism)
Substantive	Due Process

Law in the Time of Oxymora: The Consequences


**Law in the Time
of Oxymora**
A Synaesthesia of Language,
Logic and Law
Rostam J. Neuwirth



1. Oxymoron

"Oxymoron" [lit. 'wise-foolly']; Smartass

2. Enantiosis

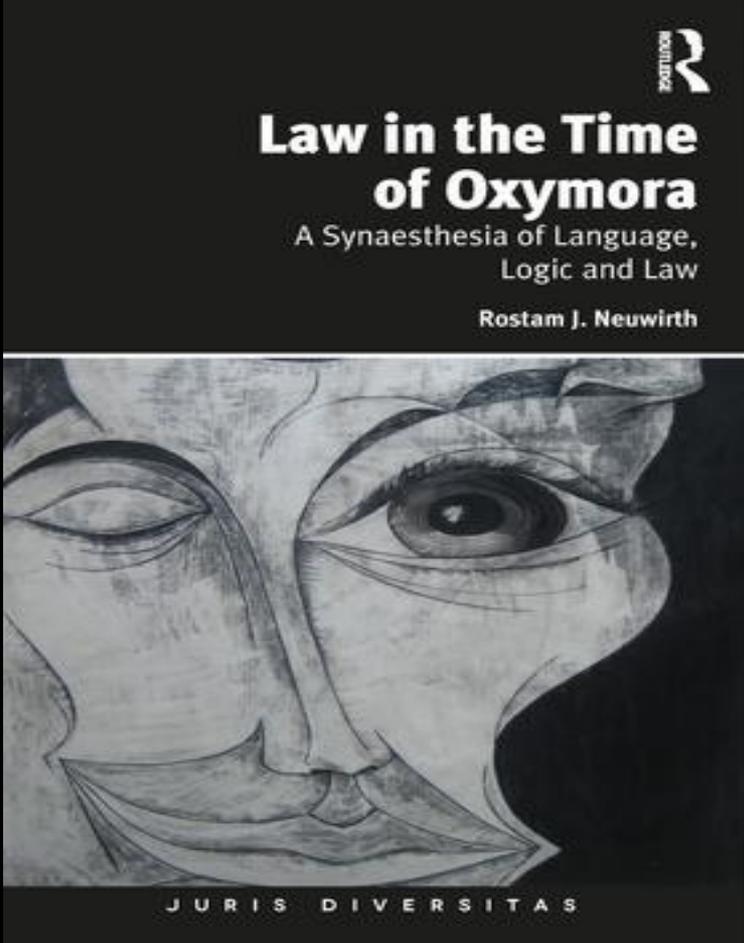
(contradiction in terms)

"ignorant savant"

3. Paradox

"I know that I know nothing"

Law in the Time of Oxymora: The Consequences



Routledge

Law in the Time of Oxymora

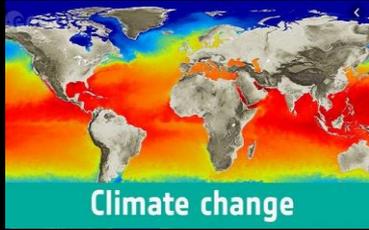
A Synaesthesia of Language,
Logic and Law

Rostam J. Neuwirth

- they **increase in number** (notably in law & science)
- they indicate a **faster pace of change**
- they complicate **decision-making**
- they increase **uncertainty** and **unpredictability**
- they **challenge** **dualistic thinking** and **binary logic**

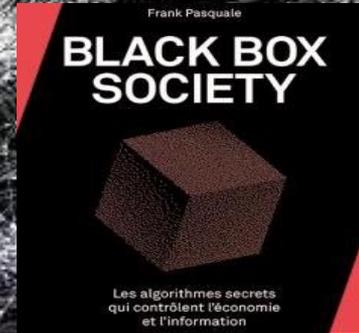
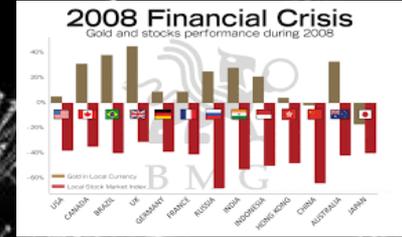
Law, Mind and Machine: Which Logic?

Law in the Time of Oxymora: The Opportunities



The United Nations system

Member State	Year of Accession	Year of Admission
Algeria	1962	1962
Andorra	1993	1993
Antigua and Barbuda	1981	1981
Argentina	1985	1985
Australia	1945	1945
Austria	1955	1955
Azerbaijan	2003	2003
Bahamas	1982	1982
Bahrain	2002	2002
Bangladesh	1974	1974
Barbados	1981	1981
Belarus	2011	2011
Belgium	1945	1945
Belize	1981	1981
Bhutan	2008	2008
Bolivia	1967	1967
Bosnia and Herzegovina	2002	2002
Brazil	1963	1963
Bulgaria	1956	1956
Burkina Faso	1983	1983
Burundi	1962	1962
Cambodia	1993	1993
Cameroon	1970	1970
Canada	1945	1945
Chad	1980	1980
Chile	1946	1946
China	1971	1971
Colombia	1977	1977
Costa Rica	1960	1960
Cote d'Ivoire	1963	1963
Cuba	1945	1945
Cyprus	1960	1960
Czechia	1993	1993
Dominica	1978	1978
Dominican Republic	1978	1978
Ecuador	1965	1965
Egypt	1956	1956
El Salvador	1982	1982
Equatorial Guinea	1973	1973
Eritrea	1995	1995
Estonia	2002	2002
Ethiopia	1975	1975
Fiji	1977	1977
Finland	1955	1955
France	1945	1945
Gabon	1963	1963
Gambia	1981	1981
Germany	1973	1973
Ghana	1967	1967
Greece	1974	1974
Guatemala	1962	1962
Haiti	1980	1980
Honduras	1980	1980
Hungary	1994	1994
Iceland	1996	1996
India	1950	1950
Indonesia	1966	1966
Iran	1974	1974
Iraq	1969	1969
Ireland	1972	1972
Israel	1949	1949
Italy	1955	1955
Jamaica	1981	1981
Japan	1956	1956
Jordan	1976	1976
Kazakhstan	2001	2001
Kenya	1963	1963
Kiribati	1982	1982
Korea	1981	1981
Kuwait	1962	1962
Kyrgyzstan	2001	2001
Laos	1975	1975
Latvia	2001	2001
Lebanon	1943	1943
Lesotho	1966	1966
Lithuania	2001	2001
Luxembourg	1948	1948
Macao	1999	1999
Madagascar	1960	1960
Mali	1960	1960
Maldives	2009	2009
Malta	1981	1981
Mexico	1945	1945
Moldova	2005	2005
Morocco	1956	1956
Mozambique	1975	1975
Nicaragua	1985	1985
Niger	1974	1974
Nigeria	1960	1960
North Macedonia	2001	2001
Norway	1969	1969
Oman	1971	1971
Pakistan	1974	1974
Panama	1977	1977
Papua New Guinea	1975	1975
Paraguay	1962	1962
Peru	1963	1963
Philippines	1975	1975
Poland	1991	1991
Portugal	1976	1976
Romania	1974	1974
Russia	1991	1991
Rwanda	1962	1962
Saudi Arabia	1982	1982
Senegal	1960	1960
Serbia	2001	2001
Seychelles	1976	1976
Singapore	1965	1965
Slovakia	2001	2001
Slovenia	2002	2002
South Africa	1994	1994
South Korea	1981	1981
Spain	1977	1977
Sri Lanka	1982	1982
St. Kitts and Nevis	1984	1984
St. Lucia	1981	1981
St. Vincent and the Grenadines	1979	1979
Sweden	1976	1976
Switzerland	1948	1948
Taiwan	1981	1981
Tanzania	1963	1963
Togo	1960	1960
Tonga	1976	1976
Turkey	1962	1962
Turkmenistan	2001	2001
Uganda	1962	1962
Ukraine	2001	2001
United Arab Emirates	1971	1971
United Kingdom	1945	1945
United States of America	1945	1945
Uruguay	1985	1985
Uzbekistan	2001	2001
Venezuela	1961	1961
Vietnam	1977	1977
Yemen	1982	1982
Zambia	1965	1965
Zimbabwe	1980	1980

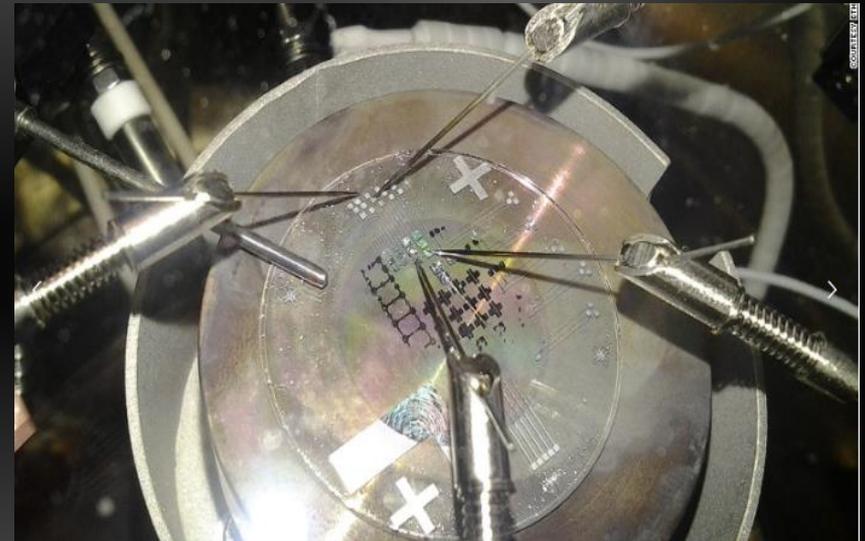


2 Examples for a Changing Logic: (Legal) Mind and Machine

Conchita Wurst



Memristor [Memory - Resistor]



Law, Mind and Machine: Which Logic?

1. CONCHITA WURST



'GENDER EQUALITY'

Austrian Civil Status Act 2013

Personenstandsgesetz 2013

Facts of the Case

The ex officio review was performed on the occasion of a **complaint filed by a person** from Upper Austria, who tried to have the gender entry into the **Central Civil Register changed to a term other than “male” or “female”**. As the application was rejected both by the **mayor's office in charge and by the competent provincial administrative court**, the applicant subsequently turned to the Constitutional Court. The judges of the Constitutional Court granted the complaint.

Austrian Constitutional Court:

VfGH - G 77/2018-9 (15. Juni 2018)

Findings

- **This requirement is met by the 2013 Civil Register Act.** The act requires a person's sex to be entered both into the Central Civil Register and in civil status documents, but **does not specify the civil status entry to be made under "sex"**, i.e. it **does not limit the entry exclusively to "male" or "female"**. The Constitutional Court's statement on this point reads as follows: "The term used in sect.2 para.2 point 3 of the 2013 Civil Register Act is so general that it can, **without any difficulty, be interpreted to include alternative gender identities.**"

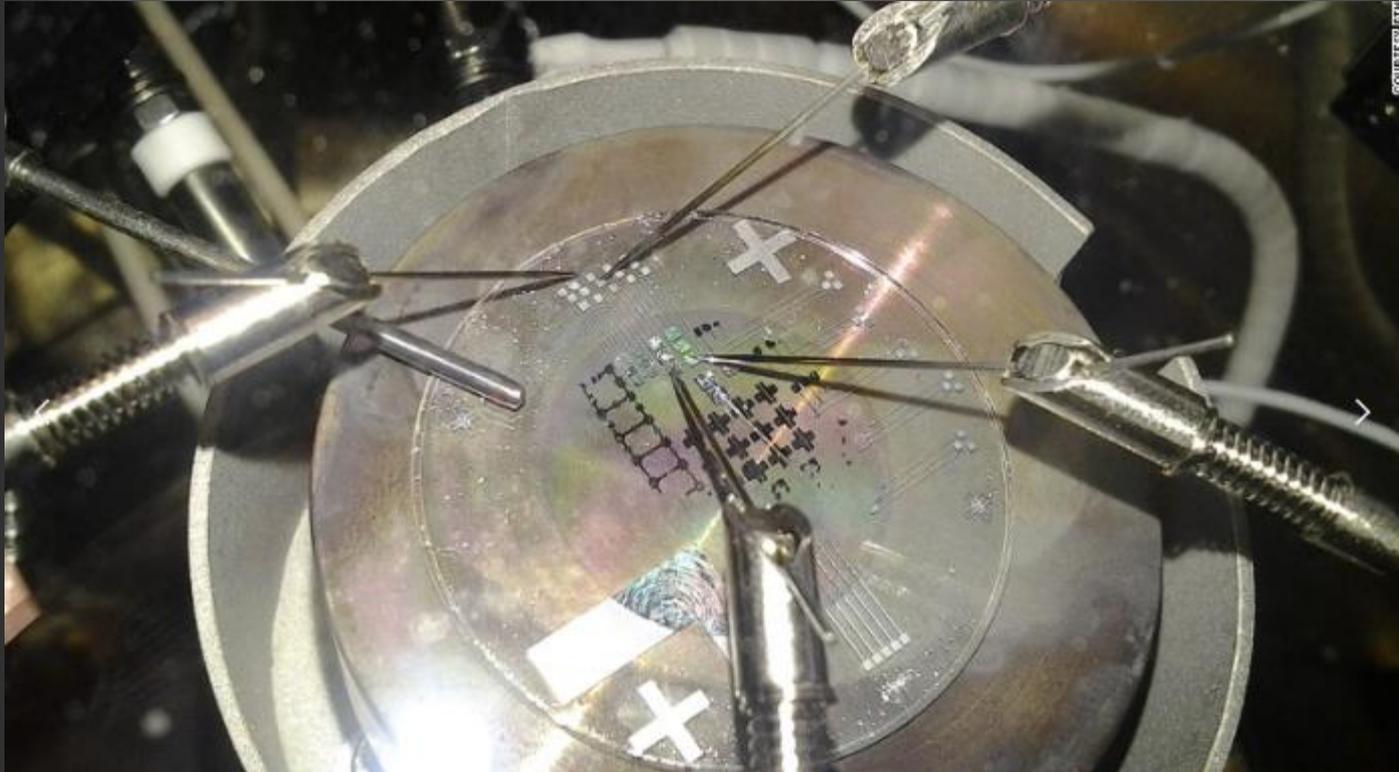
Non-Binary Gender: Beyond Dualistic Thinking in Law

Dualism in Law

We inhabit a nomos - a normative universe. We constantly create and maintain a world of right and wrong, of lawful and unlawful, of valid and void.

Robert M. Cover, "The Supreme Court, 1982 Term: Foreword: Nomos and Narrative" (1983) 97(4) Harvard Law Review 4 at 4

2. MEMRISTOR [MEMORY-RESISTOR]



'ARTIFICIAL INTELLIGENCE'

Technological Contradictions: Artificial Intelligence

Perhaps a more serious difficulty with the concept of artificial intelligence is an apparent contradiction in the very notion. On this view, “artificial intelligence” is an **oxymoron**, since intelligence implies, and artefactuality is inconsistent with, autonomy.

Ronald Chrisley, “General Introduction: The Concept of Artificial Intelligence”, in R. Chrisley & S. Begeer (eds.), *Artificial Intelligence: Critical Concepts*, Volume 1 (NY: Routledge, 2000) 1 at 3.

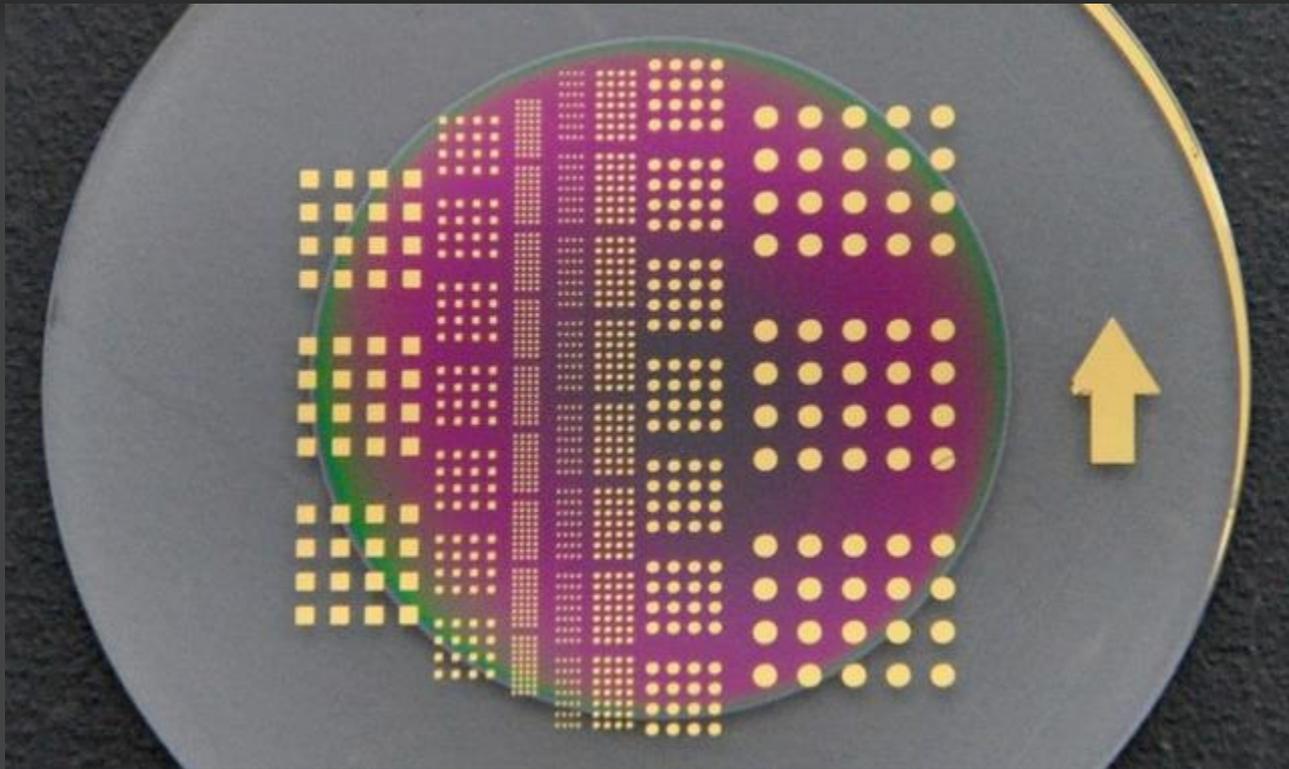
Technological Contradictions: Big (Raw) Data

We need to open a discourse—where there is no effective discourse now—about the varying temporalities, spatialities and materialities that we might represent in our databases, with a view to designing for maximum flexibility and allowing as much as possible for an emergent polyphony and polychrony.

Raw data is both an *oxymoron* and a bad idea; to the contrary, data should be cooked with care.

Geoffrey C. Bowker, *Memory Practices in the Sciences* (Cambridge: The MIT Press, 2006) 184.

A Technological Oxymoron: The MEMRISTOR



Memristors were first conceptualized in 1971 and only realized in 2008

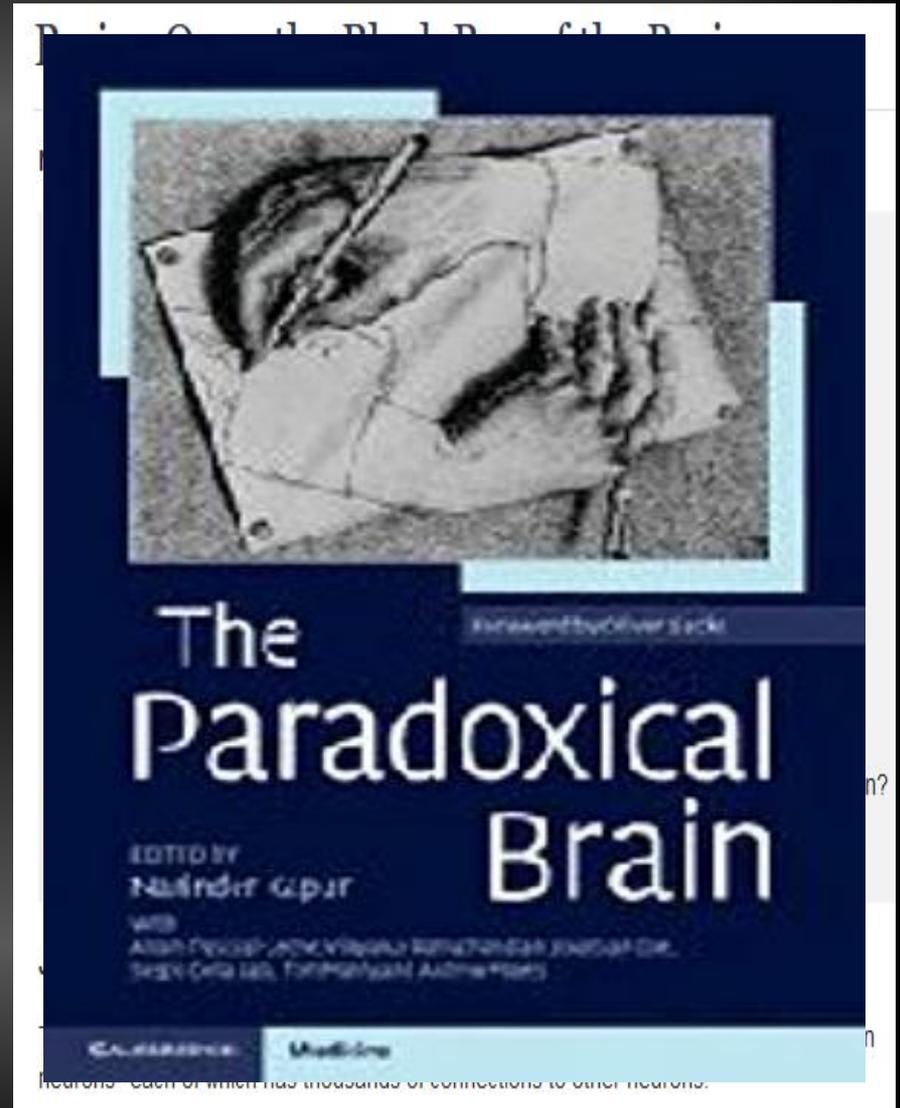
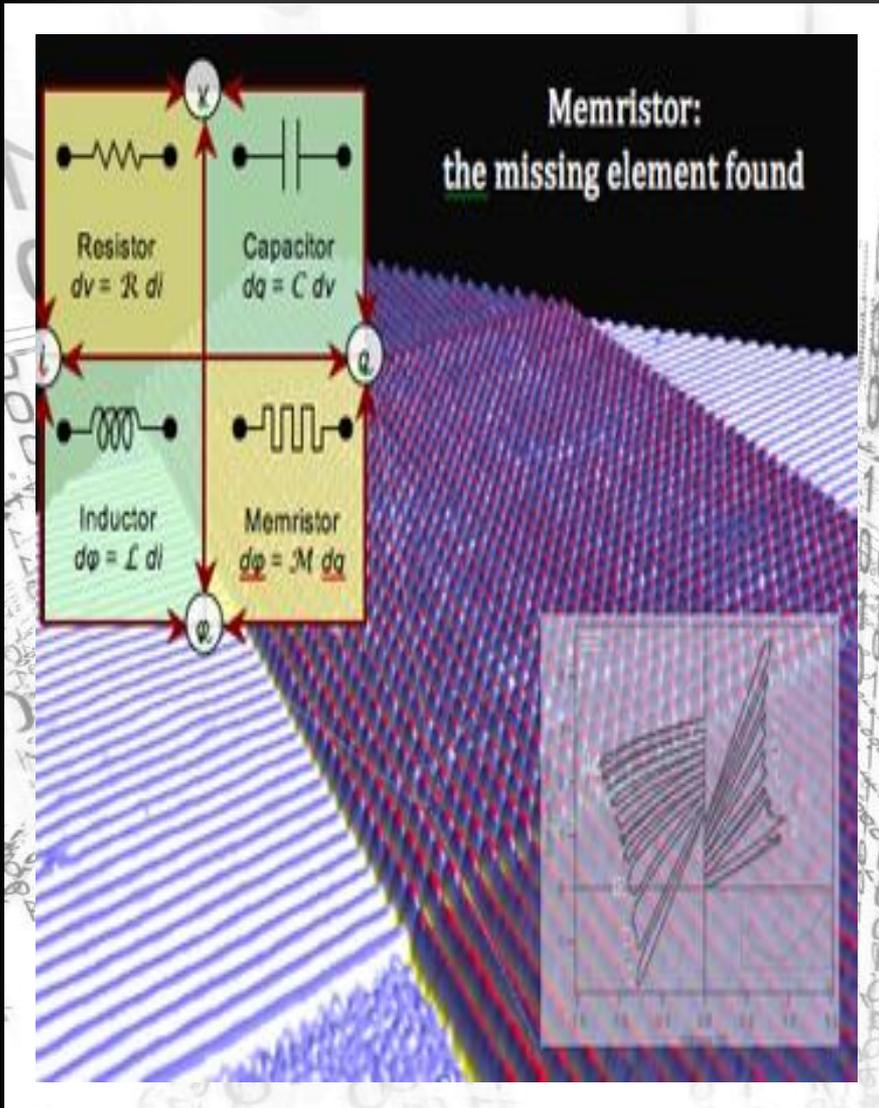
- Leon O. Chua, "Memristor - The Missing Circuit Element" (1971) 18(5) IEEE Transactions on Circuit Theory 507.
- Dmitri B. Strukov et al., "The Missing Memristor Found" (2008) 453(7191) Nature 80

Law, Mind and Machine: Which Logic?

A Technological Oxymoron: The MEMRISTOR

- Simply put, the **memristor** could mean the end of electronics as we know it and the beginning of a new era called "**ionics**" [study of ions].
- **Like a brain:** Initially, the technology will be mostly used to create super-fast memory chips that contain more data and consume less energy.
- Memristors [...] function in a way that is similar to a human brain: "Unlike a transistor, which is based on **binary codes**, a **memristor can have multi-levels**. You could have several states, let's say **zero, one half, one quarter, one third, and so on**, and that gives us a very powerful new perspective on how our computers may develop in the future" [Jennifer Rupp].

New Logics: The Mind & The Machine



Law, Mind and Machine: Which Logic?

Future of Law

If we recur then to our introductory conception that logic is really a theory about empirical phenomena, subject to growth and improvement like any other empirical discipline, we recur to it with an added conviction: namely, that [...] the infiltration into law of a more experimental and flexible logic is a social as well as an intellectual need.

John Dewey, "Logical Method and Law" (1924) 10(1) *Cornell Law Quarterly* 17 at 27.

thank you very much




**Law in the Time
of Oxymora**
A Synaesthesia of Language,
Logic and Law
Rostam J. Neuwirth



Rostam Josef NEUWIRTH
Email: rostam.neuwirth@alumni.eui.eu