Author: Dan C. Baciu, ORCiD: 0000-0002-0043-5616
Title: Cultural Diversification Processes and the Culture Radar
Version: Final Published Version.
Type: Public lecture
Publisher: *MAT Seminar Series 2019-2020*
Publication date: April 20, 2020
Location: University of California, Santa Barbara.

Links:
escholarship.org/uc/item/4993b2vq
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MAT Seminar Series 2019-2020

April 20, 2020

Cultural Diversification Processes and the Culture Radar

Dan C. Baciu, Ph.D.,
University of California, Santa Barbara,
Department of English,
Department of the History of Art and Architecture.
ORCiD: 0000-0002-0043-5616

Abstract

Culture is the integration of thought shared by entire collectives of people. In my research, I ask how entire groups of authors and audiences shape culture: What is it that evolves; what rules can be observed; and how are multiple observations related to each other? Answering these questions requires not only exact thinking and hypothesis testing but also the ability to visualize predictions, first in your mind's eye, and second by collecting data, decoding, analyzing, synthesizing, and rendering on the computer screen. This present lecture summarizes some of my theoretical propositions as well as empirical testing, focusing in particular on one visual tools for geographical analysis of public media. I also give an outlook on how this geographical interface is intended to become a cultural radar that shows how culture grows and comes towards you and could attract the same breadth of audience as a regular rain radar.

Transcript of Video

Culture is endless. People give countless names to other people and to natural, biological, and imaginary entities such as mountains, rivers, the fish in them, the cities around them, their technological achievements, their history, fashions, and myths (A). Furthermore, culture allows people to make countless connections between these named entities. You can think for example of couples, groups, and networks (B). Yet, the question is how cultural life discovers its infinite hidden potentialities. One can never fully explore all of them

(C).

In my dissertation, I wanted to better understand cultural life together with the basic processes that support diversification and growth. To achieve this goal, I developed a theory based on two premises: First, individual human brains are able to make associations. Second, the brain controls incoming stimuli through homeostatic regulation. (If you have never heard the word homeostasis, imagine it as the intellectual thermostat of the brain.) Based on these premises, the theory makes statements about the behavior of entire groups of authors and audiences. Association-making and homeostasis are translated from the scale of the individual brain to a large, collective scale. Entire groups of people create culture and develop collective memories (D).

To operationalize my theory (and put its predictions to the test against empirical data and historical experience), I also developed new laboratory methods. I called my toolbox Dissemination Workflow. Today, I will briefly outline how it works (E).

To understand my idea, imagine you are a journalist. (I once worked as a journalist, founding a professional magazine.) You receive a new topic to report on. You read about it. You perfectly master the spoken and written word, but you don't understand the content of the articles you read. There are simply too many named entities you never heard about: too many new people, to many new ideas. Your first step will be to mark these named entities and look them up in an encyclopedia.

Luckily, since 2006, there exists a computer program that can help you. It's called Wikifier. The Wikifier will take your text, mark named entities, and link them to Wikipedia. That way, it's easier for anyone to look them up.

My idea was to use the Wikifier not as a journalist, but as a scientist. I got a grant, scientific support, access to a large digital library, and access to a supercomputer. My team wikified 50 million pages of news and books—all texts that mentioned the Chicago school, the topic I chose to test my theory on (F).

Linking these data to an encyclopedia allowed me to go beyond my personal knowledge, extracting information about many more named entities mentioned in these data; places I had never heard of, dates when people were born, or locations where institutions reside (G). The next step was to analyze this structured information.

Based on my theory, I developed an algorithm to simulate associative and collective

memory. Once the math was put to paper (H), it turned out that researchers since the 1960s had already discovered that algorithms similar to mine actually produce meaningful things (I). This was an empirical hint form me that my theory may work on a really large scale. Other researchers had made observations similar to the ones that my causal model predicts. My implementation made it possible to study the formation of cultural circles as well as cultural diversification and polarization on a large scale.

The Dissemination Workflow differs from other approaches in that it works with named entities at all steps of decoding, analysis, and synthesis (L). Once the analysis is completed, multiple layers of analyzed information, geographical, historical, etc., can be compared to and mapped upon each other. This type of synthesis allows for new ways of hypothesis testing.

My theory posits that, in culture, the unit of evolutionary selection is not the isolated idea but the group of similar ideas. The Dissemination Workflow decodes, analyzes, and maps such groups of ideas (M). Each map you see on the screen is the estimated geographical distribution of one such cultural unit. Evolution within one unit and evolution between multiple units obeys different rules and different mathematics. The first is described through variation-selection processes, the latter through homeostatic regulation (R1-9).

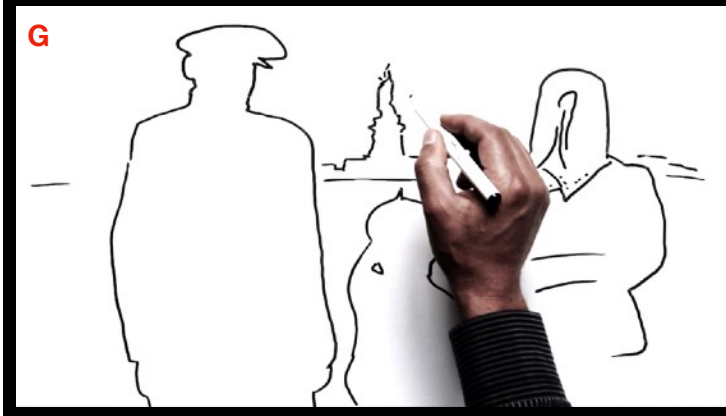
I was lucky to find many computer science students willing to help me write the computer code. Taking a data mining class, I started with three of my peers. The following years, there were six, nine, twelve, and an entire class working under my direction. At UCSB, two of my art history students were willing to join my lab, and also a geographer, as well as two gifted MAT designers, Sihwa Park and Xindy Kang. They helped develop visual interfaces that are interactive (N).

In the map on the screen, you can zoom in and out. You can click on each data-point. The white points are publishers. The red ones are named entities extracted from the news. The yellow lines connect the publishers to the content that they published (S1-5). Each map represents a group of ideas, one unit of evolutionary selection in a given larger discourse (T1-5). The green haze represents the overall density of that larger discourse. The haze is like the nightlights seen on satellite images (U-Y). It is the larger urban environment in which ideas are disseminated and received. One of the beauties of this workflow and interface is that it allows you to zoom into any city you haven't yet visited and see

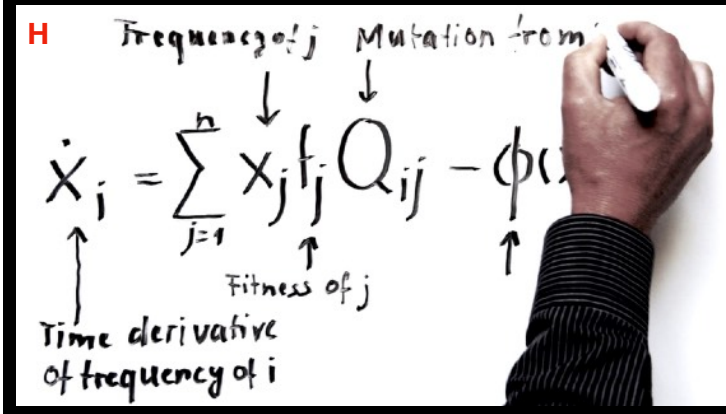
E

F

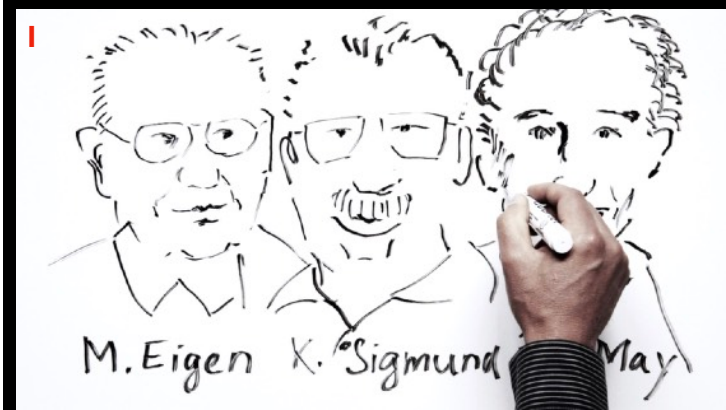
G



H



I



how named entities lined along its streets enter global culture (Z1-5).

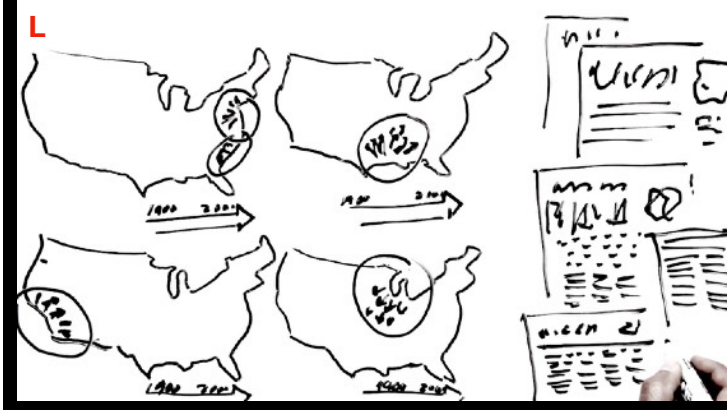
In the last five years, I applied my theory to study the Chicago school, science and humanities, as well as environmental awareness in the Arctic. There is room for much more analysis, mapping, and design (O). My next step is to develop a cultural radar. The cultural radar is like a rain radar, but with culture. It shows how named entities enter global culture from along the streets of cities and elsewhere. In addition, the culture radar also shows how groups of ideas grow and come toward you in real time (P).

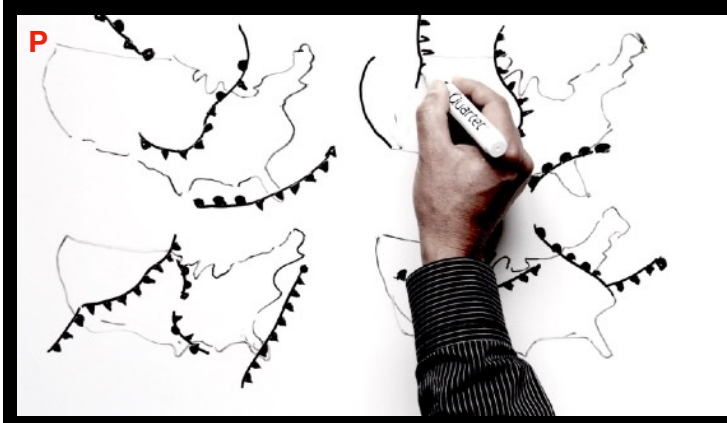
Ultimately, I hope that my theory will be a contribution to the study of those large-scale problems that people have a hard time addressing because they require large-scale cooperation. These problems include urban and social segregation, awareness of environment and biodiversity, as well as epidemics. All of these problems have in common that they are somehow related to urbanization and they cannot be solved unless people find a cultural basis to cooperate (Q).

This recording was produced by Dan C. Baciu in Santa Barbara, California, April 20, 2020.

Bio

"United we stand" inspires not only collaborative spirit but also a new research direction in the study of urban life and diversity. "United" in this context means listening to everyone and learning to coordinate efforts in the making and spreading of culture. Through art, art shows, creative writing, architecture, criticism, editorial work, photography, teaching, data science, supercomputing, urbanism, as well as doctorate and postdoctorate **Dan C. Baciu** has probed and shaped this research direction. His doctoral project "From Everything Called Chicago School to the Theory of Varieties" was awarded cross-national grants and science support paving the path to the WhatEvery1Says Interpretation Laboratory at UC Santa Barbara. There, Dr. Baciu brings together an entire interdisciplinary team of designers, data scientists, urban geographers, historians, English scholars, and beyond. In a time of rapid urbanization, data overload, and revolutionary wealth, as Alvin and Heidi Toffler contemplated, understanding how culture evolves on a large scale will prove increasingly important. When fake news shakes the modern world, and when companies are no longer valued for their transaction volume alone, but also for the data that they amass, we can no longer refrain from studying how people estimate the value of the messages that they read, write, rewrite, and share. Culture is the only means by which we can strike a balance between revolutionary wealth on one hand and decaying ecosystems, losses in biodiversity, epidemics, and depletion of natural resources on the other. Understanding culture on a global scale can no longer be postponed.





Q

R1
GeoD

R2
GeoD

R3
GeoD

R4
GeoD

R5
GeoD

R6
GeoD

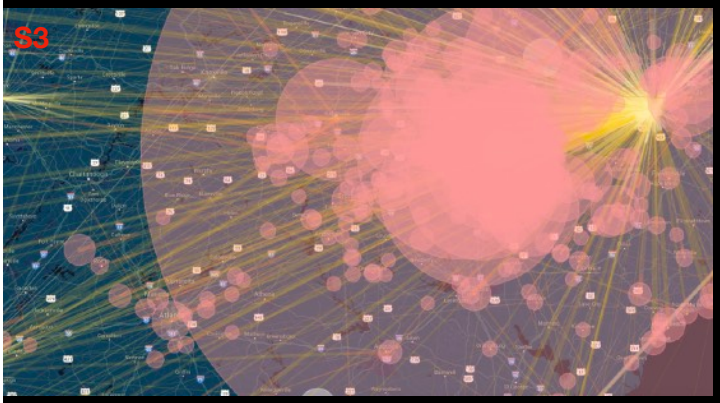
R7
GeoD

R8
GeoD

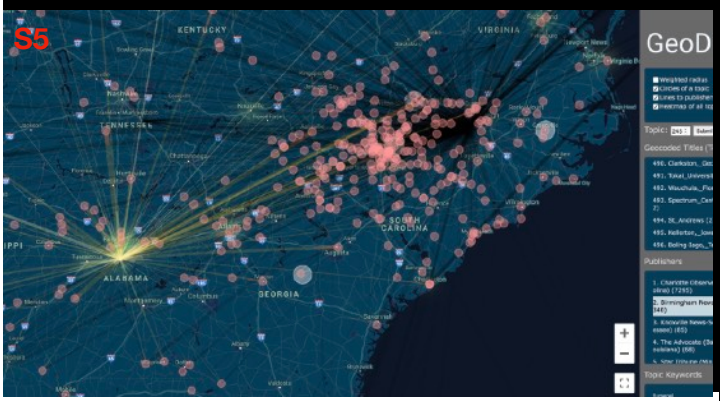
R9
GeoD

S1
Canada
United States
Mexico

S2
United States
Mexico


S3

S4
KENTUCKY
VIRGINIA
TENNESSEE
SOUTH CAROLINA
ALABAMA
GEORGIA
GeoD


S5
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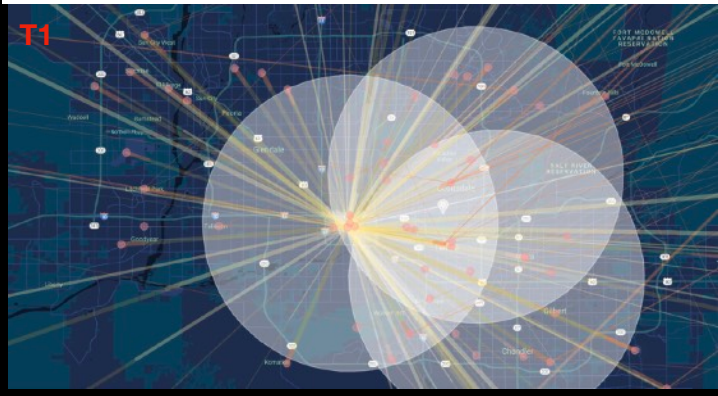
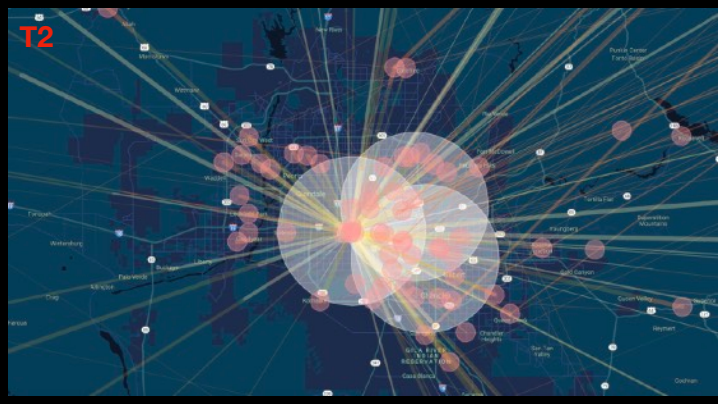
VIRGINIA
TENNESSEE
SOUTH CAROLINA
ALABAMA
GEORGIA
GeoD


T1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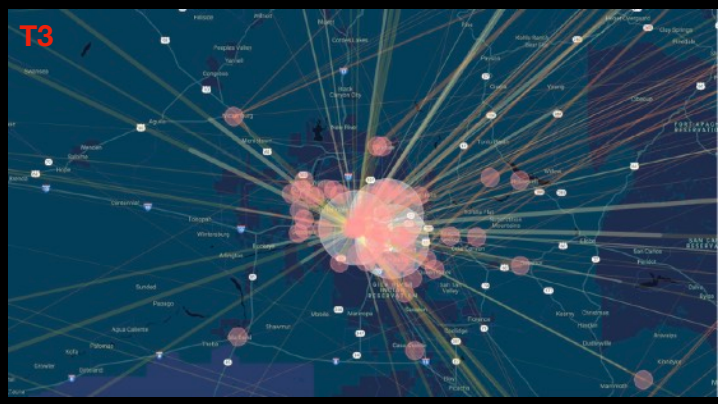
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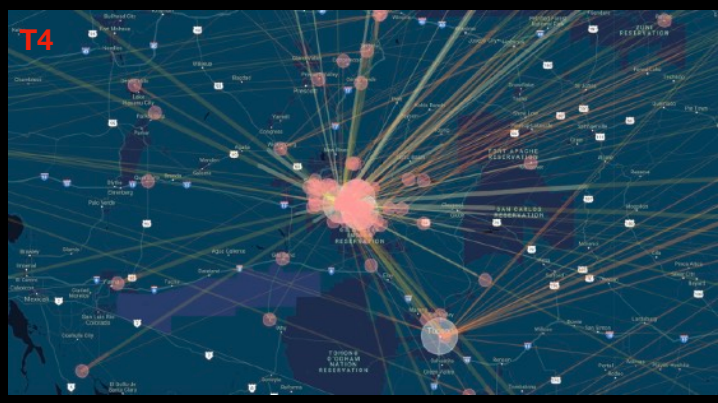
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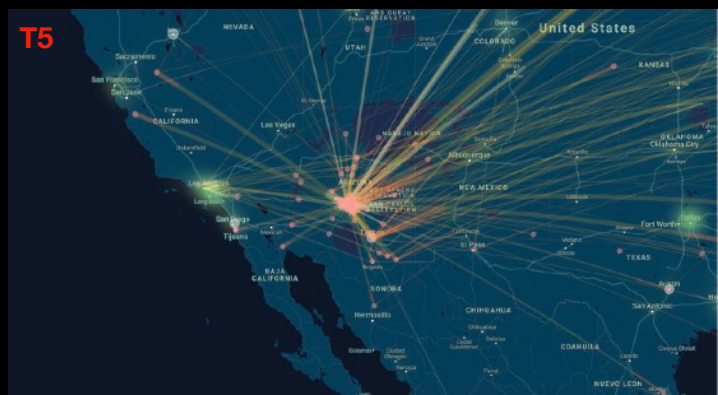
T5
United States
NEVADA
UTAH
COLORADO
KANSAS
CALIFORNIA
NEW MEXICO
TEXAS
OKLAHOMA
BAJA CALIFORNIA
SONORA
CHIHUAHUA
COAHUILA
NUEVO LEON

U
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V
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X
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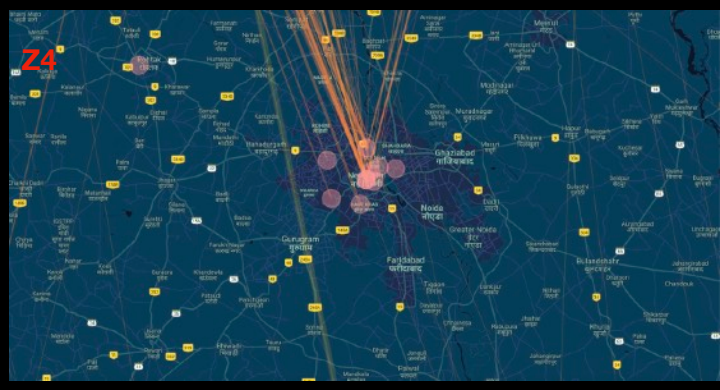
Y
GeoD

Z1

Z2

Z3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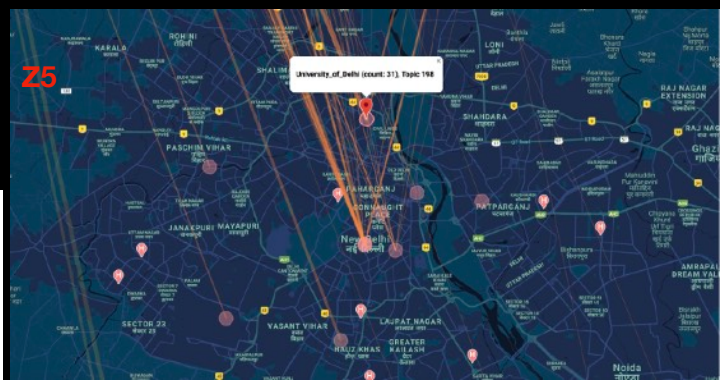
Z5

Cite

Dan Baciu (ORCiD: 0000-0002-0043-5616), “Cultural Diversification Processes and the Culture Radar,” lecture, *MAT Seminar Series 2019-2020,* Santa Barbara: University of California, Santa Barbara*,* April 20, 2020.

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