FUZZY LOGIC IN POLITICS

POS 6933 SECTION 6282
DEPARTMENT OF POLITICAL SCIENCE – UF
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DESCRIPTION

Many years ago Charles S. Pierce stated that "vagueness is no more to be done away with in the world of logic than friction in mechanics." Likewise, Bertrand Russell retorted, "everything is vague to a degree you do not realize till you have tried to make it precise." Vagueness and equivocation are constitutive features of human systems of communication and thinking. Human beings cannot live, think, and communicate without using natural languages, yet the latter are inherently vague and equivocal. Addressing the problem of linguistic vagueness is no easy task because most social sciences variables are often difficult to precisely operationalize, a problem that confronts equally those inclined to use either qualitative or quantitative methods of analysis. Constantly seeking more conceptual and operational precision and crispness is hence commonly believed to be a golden rule to the production of high quality research work in social sciences.

Contra this conventional wisdom, methods based on fuzzy logic raise the question: What if instead of seeking to get rid of language-caused vagueness we make its preservation an essential requirement for analyzing social science phenomena, both theoretically and empirically? Methods based on fuzzy logic thus deal with sets or categories whose boundaries are blurry or, in other words, "fuzzy," and which are expressed in a formalism that uses fuzzy sets, fuzzy numbers or words to compute. Exploring the relatively new field of fuzzy-logic as applied to social and political phenomena takes us into a yet to be explored rich territory of research questions, theoretical arguments, and policy insights. Every theory and every empirical analysis of social phenomena is underpinned in a given logic of reasoning for judging coherence, consistency and the possibility of falsification. Much of what counts as social science today is based on a Boolean logic with two truth values, 0 and 1. The task set out for this course is to go beyond this assumption by showing that fuzzy logic is undoubtedly very useful in analyzing empirical data, studying causation, formal models, and strategic reasoning in social science theories. This course hence presents a more or less – fuzzily – accessible introduction to fuzzy logic methodologies, focusing on applicability to the social sciences.

CONSTITUTIVE AND REGULATIVE RULES

- Students are required to "digest" the weekly readings before each class and thus come to class prepared to fully discuss the readings in depth and share their wisdom with the class.

- Each student is required to formulate two discussion questions generated by the readings each week.
- Each student is required to make a number of 15-minute presentations and lead the subsequent discussion for the first hour of class on the topics addressed in one of his/her weekly assignment.
- A major component of the course evaluation will be a term research paper. The assignment consists in choosing in consultation with the instructor a paper already published in an academically referred journal which uses fuzzy logic (broadly defined) as a method of analyzing social/political phenomena. The student is to reproduce the whole analysis of the paper and hence validate/critique the published paper.
- There is a zero-percent tolerance on plagiarism.
- Information on current UF grading policies for assigning grade points: http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html .

GRADING POLICY

- Submitting through email two questions every week (including week 1): 15 sets of questions are required and count all-together for 5% of the final grade.
- Presenting assigned chapters and leading the ensuing discussions: 45% of the final grade.
- Research paper: 50% of the final grade.

REQUIRED TEXTS

1. Kosko, Bart. 1993. Fuzzy Thinking: The New Science of Fuzzy Logic. New York: Hyperion. Paperback version.
2. Ragin, Charles C. Ragin. 2000. Fuzzy-Set Social Science. Chicago: The University of Chicago Press.
3. Mukaidono, Masao. 2004. Fuzzy Logic for Beginners. New York: World Scientific.
4. Smithson, Michael and Jay Verkuilen. 2006. Fuzzy Set Theory: Applications in the Social Sciences. New York: Sage Publications.
5. Rihoux, Benoit and Charles C. Ragin. 2009. Configurational Comparative Methods: Qualitative Comparative Analysis (QCA) and Related Techniques. New York: Sage Publications.
6. Clark, Terry D., Jenifer M. Larson, John N. Moderson, Joshua D. Potter, and Mark J. Wierman. Applying Fuzzy Mathematics to Formal Models in Comparative Politics. New York: Springer-Verlag Press. (**available from instructor**)
7. Arfi, Badredine. 2010. Linguistic Fuzzy Logic Methods in Social Sciences. New York: Springer-Verlag. Forthcoming. (**available from instructor**)

WEEKLY READING ASSIGNMENTS AND OUTLINE OF THE COURSE

Week 1 / August 25:
- Fuzzy Thinking. Chapters Parts I and II (pp. 3-116)

Week 2 / September 1:
- Fuzzy Thinking. Chapters Parts III and IV (pp. 119-285)

MONDAY, SEPTEMBER 7: LABOR DAY

Week 3/ September 8:
- Ragin: Fuzzy-Set Social Science. Part I (pp. 3-145)

Week 4/ September 15:
- Ragin: Fuzzy-Set Social Science. Part II (pp. 149-333)

Week 5/ September 22:
- Fuzzy Logic for Beginners. Whole book. (100 pages)

Week 6/ September 29:
- Smithson: Fuzzy Set Theory. Applications in the Social Sciences. Whole book.

Week 7/ October 6:
- Rihoux: Configurational Comparative Methods. Introduction, Chapters 1, 2, and 3.

Week 8/ October 13:
- Rihoux: Configurational Comparative Methods. Introduction, Chapters 4 and 5.

HOMECOMING OCTOBER FRIDAY 16 - SATURDAY 17

MILLENNIUM CONFERENCE (LONDON) OCTOBER FRIDAY 16 – THURSDAY 22

Week 9/ October 27:
- Rihoux: Configurational Comparative Methods. Chapters 6, 7 and 8.

Week 10/ November 3:
- Clark: Applying Fuzzy Mathematics to Formal Models. Chapters 1 and 2.

Week 11/ November 10:
- Clark: Applying Fuzzy Mathematics to Formal Models. Chapters 4 and 5.

WEDNESDAY, NOVEMBER 11: VETERANS DAY

Week 12/ November 17:
- Clark: Applying Fuzzy Mathematics to Formal Models. Chapters 6 and 7.

Week 13/ November 24:

- Arfi: Linguistic Fuzzy Logic Methods in Social Sciences. Chapters 1, 2, and 3.

THURSDAY & FRIDAY, NOVEMBER 26-27: THANKSGIVING

Week 14/ December 1:

- Arfi: Linguistic Fuzzy Logic Methods in Social Sciences. Chapters 4 and 5.

Week 15/ December 8:

- Arfi: Linguistic Fuzzy Logic Methods in Social Sciences. Chapters 6 and 7.