



The Mathematics of Voting

KAMUELA E. TONG

ASSOCIATE PROFESSOR OF MATHEMATICS

UNIVERSITY OF HAWAII – WEST OAHU

Mathematical Theory Of Elections

Lewis Lum, David C. Kurtz



Mathematical Theory Of Elections:

The Mathematical Theory of Elections Joseph Malkevitch, 1985 *The Mathematical Theory of Elections* Joseph Malkevitch, Gary W. Froelich, High School Mathematics and Its Applications Project (HiMAP), Consortium for Mathematics and Its Applications (U.S.), 1989 The Theory of Committees and Elections by Duncan Black and Committee Decisions with Complementary Valuation by Duncan Black and R.A. Newing Iain S. McLean, Alistair McMillan, Burt L. Monroe, 2013-03-09

R H Coase Duncan Black was a close and dear friend A man of great simplicity un worldly modest diffident with no pretensions he was devoted to scholarship In his single minded search for the truth he is an example to us all Black s first degree at the University of Glasgow was in mathematics and physics Mathematics as taught at Glasgow seems to have been designed for engineers and did not excite him and he switched to economics which he found more congenial But it was not in a lecture in economics but in one on politics that he found his star One lecturer A K White discussed the possibility of constructing a pure science of politics This question caught his imagination perhaps because of his earlier training in physics and it came to absorb his thoughts for the rest of his life But almost certainly nothing would have come of it were it not for his appointment to the newly formed Dundee School of Economics where the rest of the teaching staff came from the London School of Economics At Glasgow economics as in the time of Adam Smith was linked with moral philosophy At Dundee Black was introduced to the analytical x The Theory o Committees and Elections approach dominant at the London School of Economics This gave him the approach he used in his attempt to construct a pure science of politics The Theory of Committees and Elections Duncan Black, 2012-12-06 THIS book or some related work has occupied me spasmodically over rather a long period in fact ever since I listened to the class lectures of Professor A K White on the possibility of forming a pure science of Politics Mter an earlier version of Part I had failed to obtain publication in 1947 some chapters appeared as articles and I am obliged to the editors of the journals mentioned below for permission to reprint this material sometimes in a modified form When I first attempted publication I was unacquainted with the earlier history of the theory and indeed did not even know that it had a history and the later additions to the book have largely been by way of writing the present Part II This historical section does not include the important recent work Social Ochoice and Individual Values 1951 of Professor Kenneth J Arrow but it does include all the mathematical work on committees and elections appearing before the middle of this century which has come to my notice although the last item in it is dated 1907 No doubt there is much important material which I have failed to see The theorizing of the book grew out of a reading of the English political philosophers and of the Italian writers on Public Finance At a very early stage I was helped to find the general lines of development by discussion with my colleague Professor Ronald H Voting Made Easy Lewis Lum, David C. Kurtz, 1975* *The Spatial Theory of Voting* James M. Enelow, Melvin J. Hinich, 1984-04-27 This book provides an introduction to an important approach to the study of voting and elections the spatial theory of voting In contrast to the social psychological approach to studying voting behaviour the spatial

theory of voting is premised on the idea of self interested choice Voters cast votes on the basis of their evaluation of the candidates or policy alternatives competing for their vote Candidates fashion their appeals to the voters in an effort to win votes The spatial theory provides explicit definitions for these behavioural assumptions to determines the form that self interested behaviour will take The consequences of this behaviour for the type of candidate or policy that voters will select is the major focus of the theory There is a twofold purpose to this work The first is to provide an elementary but rigourous introduction to an important body of political science research The second is to design and test a spatial theory of elections that provides insights into the nature of election contests The book will appeal to a wide audience since the mathematics is kept to an accessible level *Mathematical Theory of Democracy* Andranik Tangian,2013-07-31 The mathematical theory of democracy deals with selection of representatives who make decisions on behalf of the whole society In this book the notion of representativeness is operationalized with the index of popularity the average percentage of the population whose opinion is represented on a number of issues and the index of universality the frequency of cases when the opinion of a majority is represented These indices are applied to evaluate and study the properties of single representatives e g president and representative bodies e g parliament magistrate cabinet jury coalition To bridge representative and direct democracy an election method is proposed that is based not on voting but on indexing candidates with respect to the electorate s political profile In addition societal and non societal applications are considered *Mathematical Analyses of Decisions, Voting and Games* Michael A. Jones,David McCune,Jennifer M. Wilson,2024-03-25 This volume contains the proceedings of the virtual AMS Special Session on Mathematics of Decisions Elections and Games held on April 8 2022 Decision theory voting theory and game theory are three related areas of mathematics that involve making optimal decisions in different contexts While these three areas are distinct much of the recent research in these fields borrows techniques from other branches of mathematics such as algebra combinatorics convex geometry logic representation theory etc The papers in this volume demonstrate how the mathematics of decisions elections and games can be used to analyze problems from the social sciences

The History Of Game Theory, Volume 1 Mary-Ann Dimand,Robert W Dimand,1996-08-08 This first volume of three examines the methodological origins of game theory up to the Second World War It adds to the understanding of game theory s contentious roots and offers insights into modern applications of the theory [The New Palgrave Dictionary of Economics](#) ,2016-05-18 The award winning The New Palgrave Dictionary of Economics 2nd edition is now available as a dynamic online resource Consisting of over 1 900 articles written by leading figures in the field including Nobel prize winners this is the definitive scholarly reference work for a new generation of economists Regularly updated This product is a subscription based product **Institutional Design and Voting Power in the European Union** Karol

Zyczkowski,2016-05-23 Leading global experts in the field of politics and mathematics bring forth key insights on how voting power should be allocated between EU member states and what the policy consequences are of any given institutional design

Close attention is paid to the practical implications of decision making rules the nature and distribution of power and the most equitable ways to represent the preoccupations of European citizens both in the Council and European Parliament Highly theoretical and methodologically advanced this volume is set to enrich the debate on the future of the EU s institutional design A valuable source of information to scholars of political science European studies and law as well as to people working on game theory theory of voting and in general applications of mathematics to social science A Unified Theory of Collective Action and Social Change Luis Medina,2009-12-18 The notion that groups form and act in ways that respond to objective external costs and benefits has long been the key to accounting for social change processes driven by collective action Yet this same notion seems to fall apart when we try to explain how collectivities emerge out of the choices of individuals This book overcomes that dilemma by offering an analysis of collective action that while rooted in individual decision making also brings out the way in which objective costs and benefits can impede or foster social coordination The resulting approach enables us to address the causes and consequences of collective action with the help of the tools of modern economic theory To illustrate this the book applies the tools it develops to the study of specific collective action problems such as clientelism focusing on its connections with economic development and political redistribution and wage bargaining showing its economic determinants and its relevance for the political economy of the welfare state Medina s study is a great step forward in the analytics of collective action He shows the inadequacies of currently standard models and shows that straightforward revisions reconcile rational choice and structural viewpoints It will influence all future work Kenneth Arrow Stanford University Olson Schelling and now Medina A Unified Theory deepens our understanding of collective action and contributes to the foundations of our field A major work Robert H Bates Harvard University Medina thinks that the main problem of social action is not whether or not to cooperate but how to do it To this end he has produced an imaginative approach to analyzing strategic coordination problems that produces plausible predictions in a range of circumstances John Ferejohn Stanford University Luis Fernando Medina is Associate Professor in the Department of Politics at the University of Virginia Abstract Algebra with Applications Audrey Terras,2019 This text offers a friendly and concise introduction to abstract algebra emphasizing its uses in the modern world **Elections, Voting Rules and Paradoxical Outcomes** William V. Gehrlein,Dominique Lepelley,2017-10-14 This monograph studies voting procedures based on the probability that paradoxical outcomes like the famous Condorcet Paradox might exist It is well known that hypothetical examples of many different paradoxical election outcomes can be developed but this analysis examines factors that are related to the process by which voters form their preferences on candidates that will significantly reduce the likelihood that such voting paradoxes will ever actually be observed It is found that extreme forms of voting paradoxes should be uncommon events with a small number of candidates Another consideration is the propensity of common voting rules to elect the Condorcet Winner which is widely accepted as the best choice as the winner when it exists All common voting rules are

found to have identifiable scenarios for which they perform well on the basis of this criterion But Borda Rule is found to consistently work well at electing the Condorcet Winner while the other voting rules have scenarios where they work poorly or have a very small likelihood of electing a different candidate than Borda Rule The conclusions of previous theoretical work are presented in an expository format and they are validated with empirically based evidence Practical implications of earlier studies are also developed *Proceedings of the XIV INTERNATIONAL SYMPOSIUM SYMORG 2014* Aleksandar

Marković, Slađana Barjaktarović Rakočević, 2014-06-05 **Handbook of Game Theory with Economic Applications** R.J.

Aumann, S. Hart, 1992 This is the second of three volumes surveying the state of the art in Game Theory and its applications to many and varied fields in particular to economics The chapters in the present volume are contributed by outstanding authorities and provide comprehensive coverage and precise statements of the main results in each area The applications include empirical evidence The following topics are covered communication and correlated equilibria coalitional games and coalition structures utility and subjective probability common knowledge bargaining zero sum games differential games and applications of game theory to signalling moral hazard search evolutionary biology international relations voting procedures social choice public economics politics and cost allocation This handbook will be of interest to scholars in economics political science psychology mathematics and biology For more information on the Handbooks in Economics series please see our home page on <http://www.elsevier.nl/locate/hes> **Multiperson Decision Making Models Using Fuzzy Sets and**

Possibility Theory J. Kacprzyk, Mario Fedrizzi, 2012-12-06 Decision making is certainly a very crucial component of many human activities It is therefore not surprising that models of decisions play a very important role not only in decision theory but also in areas such as operations Research Management science social Psychology etc The basic model of a decision in classical normative decision theory has very little in common with real decision making It portrays a decision as a clear cut act of choice performed by one individual decision maker and in which states of nature possible actions results and preferences are well and crisply defined The only component in which uncertainty is permitted is the occurrence of the different states of nature for which probabilistic descriptions are allowed These probabilities are generally assumed to be known numerically i.e. as single probabilities or as probability distribution functions Extensions of this basic model can primarily be conceived in three directions 1 Rather than a single decision maker there are several decision makers involved This has led to the areas of game theory team theory and group decision theory 2 The preference or utility function is not single valued but rather vector valued This extension is considered in multiattribute utility theory and in multicriteria analysis 3 **Towards Trustworthy Elections** David Chaum, Markus Jakobsson, Ronald L. Rivest, Peter Y. A. Ryan, Josh

Benaloh, Mirosław Kutyłowski, Ben Adida, 2010-06-09 State of the art report source unknown **A Unified Theory of Collective Action and Social Change** Luis Fernando Medina Sierra, 2007-05-31 An intriguing examination of one of the most important unresolved problems in social choice theory how do we best understand people's decision to pay the cost of a

public good *The Electoral College and Direct Election* United States. Congress. Senate. Committee on the Judiciary, 1977

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