

Capitole Speciale De Inteligenta Artificiala Ubm

Written for the novice AI programmer, this text introduces the reader to techniques such as finite state machines, fuzzy logic, neural networks and many others in an easy-to-understand language, supported with code samples throughout the text.

Membrane computing is an unconventional model of computation associated with a new computing paradigm. The field of membrane computing was initiated in 1998 by the author of this book; it is a branch of natural computing inspired by the structure and functioning of the living cell and devises distributed parallel computing models in the form of membrane systems. This book is the first monograph surveying the new field in a systematic and coherent way. It presents the central notions and results: the main classes of P systems, the main results about their computational power and efficiency, a complete bibliography, and a series of open problems and research topics.

In a future world of rampant inequality, a martial-arts video star finds himself in a real fight for survival, in this novel by the author of *Schismatrix*. Founded centuries ago by the enigmatic genius Moses Moses, the planet Reverie can either be heaven or hell, depending on whether you live on or above it. The superrich orbit the world in luxury abodes, keeping their sometimes-lethal ennui at bay by watching homemade sex and violence videos created by the peons dwelling on the coral continents miles beneath them. The most popular entertainer of all is the Artificial Kid, an unbeatable combat artist whose bloody, self-produced martial arts videos have made him beloved both above and below. But the Kid is about to stumble onto something no one was ever meant to discover—a mind-boggling conspiracy of science and antiquity that forces him to run for his life into the strange and dangerous wilderness known as the Mass. And when Moses Moses returns to Reverie after seven hundred years of cryogenic sleep, things are about to get much worse. Written long before the era of YouTube, Ultimate Fighting, and reality TV, Bruce Sterling's prescient, thoughtful, and wildly satiric novel previews the nascent cyberpunk sensibilities of the acclaimed author's later works.

!%@:: a Directory of Electronic Mail Addressing and Networks

An Introduction

UNESCO ICT Competency Framework for Teachers

History and Myth in Romanian Consciousness

Understanding Careers

Monitorul oficial al României

A comprehensive account of recent algorithms developed in computational number theory and primality testing. Provides a general framework for the theoretical study of public key cryptography and pseudorandom generators. Unique in its approach, the book will be a valuable addition to computer literature.

Noted for its fair and equal coverage of men and women, *Psychology of Gender* reviews the research and issues surrounding gender from multiple perspectives, including psychology, sociology, anthropology, and public health. Going far beyond discussions of biological sex and gender identity, the text explores the roles that society has assigned to females and males and the other variables that co-occur with sex, such as status and gender-related traits. The implications of social roles, status, and gender-related traits for relationships and health are also examined. The text begins with a discussion of the nature of gender and development of gender roles, before reviewing communication and interaction styles and how they impact our friendships and romantic relationships. It concludes with an exploration of how gender influences both physical and mental health. New to the 6th Edition: Emphasis on the intersectionality of gender, considering it as a part of wider social categories such as race, ethnicity, social class, and gender identity Recognition of the increasingly prevalent view that gender is nonbinary Extended coverage of LGBTQ individuals, their relationships, and their health Expanded discussions of key issues including gender-role strain, gender fluidity, women and STEM, parenthood, balancing family and work demands, online communication, and sexual harassment Accompanied by a comprehensive companion website featuring resources for students and instructors, alongside extensive student learning features throughout the book, *Psychology of Gender* is an essential read for all students of gender from psychology, women's studies, gender studies, sociology, and anthropology.

Discusses about using technology to draw people into the kind of dialogues which take them beyond themselves into learning, thinking and creativity. This book reveals key characteristics of learning dialogues and demonstrates ways in which computers and networks can deepen, enrich and expand such dialogues.

Industria lemnului

Sociology

Matematică. Serie nouă. Secțiunea I a

How the World Works

Regression Analysis by Example

AI for Game Developers

#1 NEW YORK TIMES BESTSELLER • In *Sapiens*, he explored our past. In *Homo Deus*, he looked to our future. Now, one of the most innovative thinkers on the planet turns to the present to make sense of today's most pressing issues. "Fascinating . . . a crucial global conversation about how to take on the problems of the twenty-first century."—Bill Gates, *The New York Times Book Review* **NAMED ONE OF THE BEST BOOKS OF THE YEAR BY FINANCIAL TIMES AND PAMELA PAUL, *KQED* How do computers and robots change the meaning of being human? How do we deal with the epidemic of fake news? Are nations and religions still relevant? What should we teach our children? Yuval Noah Harari's *21 Lessons for the 21st Century* is a probing and visionary investigation into today's most urgent issues as we move into the uncharted territory of the future. As technology advances faster than our understanding of it, hacking becomes a tactic of war, and the world feels more polarized than ever, Harari addresses the challenge of navigating life in the face of constant and**

disorienting change and raises the important questions we need to ask ourselves in order to survive. In twenty-one accessible chapters that are both provocative and profound, Harari builds on the ideas explored in his previous books, untangling political, technological, social, and existential issues and offering advice on how to prepare for a very different future from the world we now live in: How can we retain freedom of choice when Big Data is watching us? What will the future workforce look like, and how should we ready ourselves for it? How should we deal with the threat of terrorism? Why is liberal democracy in crisis? Harari's unique ability to make sense of where we have come from and where we are going has captured the imaginations of millions of readers. Here he invites us to consider values, meaning, and personal engagement in a world full of noise and uncertainty. When we are deluged with irrelevant information, clarity is power. Presenting complex contemporary challenges clearly and accessibly, 21 Lessons for the 21st Century is essential reading. "If there were such a thing as a required instruction manual for politicians and thought leaders, Israeli historian Yuval Noah Harari's 21 Lessons for the 21st Century would deserve serious consideration. In this collection of provocative essays, Harari . . . tackles a daunting array of issues, endeavoring to answer a persistent question: "What is happening in the world today, and what is the deep meaning of these events?"—BookPage (top pick)

This is the first book to provide a step-by-step guide to the methods and practical aspects of acquiring, modelling, storing and sharing knowledge. The reader is led through 47 steps from the inception of a project to its conclusion. Each is described in terms of reasons, required resources, activities, and solutions to common problems. In addition, each step has a checklist which tracks the key items that should be achieved.

Over the past decade, Internet technology, now merging into that of mobile technology, has transformed the multiple facets of life in society across the world, changing work and leisure patterns, and placing greater demands on us as active, democratic citizens. The Internet literacy handbook, intended for parents, teachers and young people throughout Europe, is a guide to exploiting to the fullest this complex network of information and communication. The handbook is comprised of 21 fact sheets, each covering a particular topic on Internet use, from searching for information to setting up blogs through to e-shopping and e-citizenship. These fact sheets offer teachers and parents sufficient technical know-how to allow them to share young people's and children's voyages through communication technology. They highlight ethical and safety considerations, give insight into added value in education, provide ideas for constructive activities in class or at home, share best practice in Internet use, and provide a wealth of definitions and links to sites that give practical examples and further in-depth information.

8th Edition

Introduction to Pattern Recognition

The Artificial Kid

Multivariate Statistics:

Information Science and Technology

Praise for the Fourth Edition: "This book is . . . an excellent source of examples for regression analysis. It has been and still is readily readable and understandable." –Journal of the American Statistical Association
Regression analysis is a conceptually simple method for investigating relationships among variables. Carrying out a successful application of regression analysis, however, requires a balance of theoretical results, empirical rules, and subjective judgment. Regression Analysis by Example, Fifth Edition has been expanded and thoroughly updated to reflect recent advances in the field. The emphasis continues to be on exploratory data analysis rather than statistical theory. The book offers in-depth treatment of regression diagnostics, transformation, multicollinearity, logistic regression, and robust regression. The book now includes a new chapter on the detection and correction of multicollinearity, while also showcasing the use of the discussed methods on newly added data sets from the fields of engineering, medicine, and business. The Fifth Edition also explores additional topics, including: Surrogate ridge regression Fitting nonlinear models Errors in variables ANOVA for designed experiments Methods of regression analysis are clearly demonstrated, and examples containing the types of irregularities commonly encountered in the real world are provided. Each example isolates one or two techniques and features detailed discussions, the required assumptions, and the evaluated success of each technique. Additionally, methods described throughout the book can be carried out with most of the currently available statistical software packages, such as the software package R. Regression Analysis by Example, Fifth Edition is suitable for anyone with an understanding of elementary statistics.

As with the bestselling first edition, Computational Statistics Handbook with MATLAB, Second Edition covers some of the most commonly used contemporary techniques in computational statistics. With a strong, practical focus on implementing the methods, the authors include algorithmic descriptions of the procedures as well as

Understanding Careers: The Metaphors of Working Lives uses a unique framework of nine archetypal metaphors to encapsulate the field of career studies. Using an easy-to-read style, author Kerr Inkson examines key concepts, illustrating them with over 50 authentic career cases, to build an excellent bridge between theory and "real life."

Applications of Liapunov Methods in Stability

Primality and Cryptography

Revista economică

Field-Effect and Bipolar Power Transistor Physics

Exploring Hyperlinks, Contents, and Usage Data

Covid-19: The Great Reset

The year 1992 marks the centennial anniversary of publication of the celebrated monograph "The General Problem of Stability of Motion" written by A. M. Liapunov. This anniversary inspires to think about the way theory and applications have developed during this century. The first observation one can make is that the so-called "second method", nowadays known as the "Liapunov function method", has received more attention than the "first method"; let us also mention the study of critical cases, which brought more attention recently in connection with the study of bifurcations and with nonlinear stabilization. One of the reasons of popularity of the Liapunov function approach might be the fact that, in many situations in science and engineering, and not only in mechanics,

which was the main source of inspiration for the work of Liapunov, natural Liapunov functions may be proposed, intimately connected with the properties of the processes. It is one of the purposes of this book to advocate this idea. From the mathematical viewpoint, the century after the first appearance of Liapunov's monograph has been characterized both by generalizations and by refinements of Liapunov's ideas. But we feel that the most spectacular progress is the understanding of the wide possibilities open for applications by the use of Stability Theory as constructed by Liapunov a century ago. We have tried to show some of the ideas in this direction by starting with our personal experience in the study of some models.

The concept of human dignity has been stripped from its traditional context in Christian thought, becoming "a moral trump frayed by heavy use," but a compelling alternate vision has not yet emerged. *God and Human Dignity* offers a fresh restatement of the nature and scope of human dignity in Christian perspective. Theologians, ethicists, and biblical scholars from around the world here examine the dimensions of human worth in the light of sacred Scripture, doctrine, and ecclesial practice. In contrast to modernity's often monochromatic accounts of human dignity in terms of freedom or rationality, these essays argue that human dignity in Christian perspective is a "many-splendored thing" reflecting humanity's participation in the divine drama of creation, redemption, and new creation. Representing disciplines across the academic spectrum, the essays in *God and Human Dignity* offer systematic and scriptural perspectives on human dignity that connect to a host of pressing contemporary issues.

Contributors: C. Clifton Black, Russell Botman, Don Browing, J. Kameron Carter, Elaine Graham, Robert W. Jensen, James L. Mays, M. Douglas Meeks, Esther Menn, Peter Ochs, John Polkinghorne, Hans Reinders, Gerhard Sauter, Christoph Schw bel, R. Kendall Soulen, Fraser Watts, Michael Welker, and Linda Woodhead.

Monitorul oficial al Rom niei Publica?ii ?i ?i anun?uri. Partea a III-a Analele ?tiin?ifice ale Universit??ii "Al. I. Cuza" din Ia?i Matematic?. Serie nou?. Sec?iunea I a Studii ?i cercet?ri de mecanic? aplicat? Revista economic? Introduction to Pattern Recognition A Matlab Approach Academic Press

Clitics in Phonology, Morphology and Syntax

Membrane Computing

The Aesthetics of Paradoxism (criticism)

The Internet Literacy Handbook

Imperial Rule

Studii ?i cercet?ri de mecanic? aplicat?

The Detox Miracle Sourcebook shows you how to cleanse your body of the poisons that are destroying your health, start the process of complete cellular regeneration that leads to true healing. Based on 30 years of clinical experience treating thousands of people with conditions ranging from OVERWEIGHT to CANCER, Dr. Robert Morse reveals his ultimate healing system – the Detox Miracle! • Covers the A-Z of Detoxification, including: Why do it? When to do it? What to expect? How it works, and how long it takes. • Explains the uses of specific raw foods and herbs for cleansing and healing every organ, system, and unbalanced condition in the body. • Details the interface of body, mind and soul for the achievement of lifelong health. • Presents the Detox Miracle Diet, and how to adapt it for life. • Includes dozens of easy-to-use References: lists of herbs, herbal formulas, properties of foods, minerals, phytochemicals, and cell salts, along with raw food recipes; a detailed Index; broad-based Resource Guide; and extensive Glossary and Bibliography. ONE THING I KNOW about Dr. Morse is that he has walked his talk. This amazing book leads you step-by-step through every facet of detoxification and vitality building. A treasure chest of information for the beginner and the advanced seeker alike. -David Wolfe, CEO:www.rawfood.com, author of The Sunfood Diet Success System and Eating for Beauty EXTREMELY PRACTICAL; a most informative tool. Helping others to help themselves through education provides a lasting impression upon their overall health. What better way to serve the Lord than to educate the masses. -Gary L. Axley, N.M.D., D.O.; president of Southern College of Naturopathic Medicine. CAREFULLY RESEARCHED. A "must" for the professional practitioner as well as for the layperson. Destined to become a classic. -Donald Vesser Bodeen, D.C. Ph.D. I HAVE USED DR.MORSE'S program and his herbs with many cases over the years, and with great success. This method is the real healing method for today and the future. -William Christner, N.D., C.M. THE STUDY OF THIS BOOK will be a spiritual, mental, and physical blessing for complete body health. Thank you, Dr. Morse, for a wonderful book! -Dr. Ed David, N.D., Health Education Center. Natural Health \$29.95 HOHM PRESS The Detox Miracle Sourcebook MORSE

Now in its eighth edition, this continues to be the indispensable guide to understanding the world we make and the world we lead. Revised and updated throughout, it remains unrivalled in its vibrant, engaging and authoritative introduction to sociology. The authors provide a commanding overview of recent global developments and new ideas in sociology. Classic debates are also given careful coverage, with even the most complex ideas explained in an engaging way. Written in a fluent, easy-to-follow style, the book manages to be intellectually rigorous but still very accessible. With a strong focus on interactive pedagogy, it aims to engage and excite readers, helping them to see the enduring value of thinking sociologically. The eighth edition includes: a solid foundation in the basics of sociology: its purpose, methods and theories; up-to-the-minute overviews of key topics in social life, from gender, personal life and poverty, to globalization, the media and politics; stimulating examples of what sociology has to say about key issues in our contemporary world, such as growing inequality, climate change and the rise of terrorism; a strong focus on global sociology and the ways that digital technologies are radically transforming our world; quality pedagogical features, such as Classic Studies and Global Society boxes, and Thinking Critically reflection points, as well as end-of-chapter activities inviting readers to engage with popular culture and original research articles to gather sociological insights. The eighth edition sets the standard for introductory sociology. Complete with extensive supporting resources at www.politybooks.com/giddens, it is the ideal teaching text for first-year university and college courses, and will help to inspire a new generation of sociologists.

From the Man Booker Prize-nominated author of *Sleeping on Jupiter* and "one of India's greatest living authors" (*O, The Oprah Magazine*), a poignant and sweeping novel set in India during World War II and the present day about a son's

quest to uncover the truth about his mother. In my childhood, I was known as the boy whose mother had run off with an Englishman. The man was in fact German, but in small-town India in those days, all white foreigners were largely thought of as British. So begins the "gracefully wrought" (Kirkus Reviews) story of Myshkin and his mother, Gayatri, who rebelled against tradition to follow her artist's instinct for freedom. Freedom of a different kind is in the air across India. The struggle against British rule is reaching a critical turn. The Nazis have come to power in Germany. At this point of crisis, two strangers arrive in Gayatri's town, opening up to her the vision of other possible lives. What took Myshkin's mother to India and Dutch-held Bali in the 1930s, ripping a knife through his comfortingly familiar universe? Excavating the roots of the world in which he was abandoned, Myshkin comes to understand the connections between the anguish at home and a war-torn universe overtaken by patriotism. Evocative and moving, "this mesmerizing exploration of the darker consequences of freedom, love, and loyalty is an astonishing display of Roy's literary prowess" (Publishers Weekly).

The Right Choice

The Detox Miracle Sourcebook

A World Without You

Expanding the Space of Learning

Web Data Mining

Knowledge Acquisition in Practice

The University of Paris is generally regarded as the first true university, the model for others not only in France but throughout Europe, including Oxford and Cambridge. This book challenges two prevailing myths about the university's origins: first, that the university naturally developed to meet the utilitarian and professional needs of European society in the late Middle Ages, and second, that it was the product of the struggle by scholars to gain freedom and autonomy from external authorities, most notably church officials. In the twelfth century, Paris was the educational center of Europe, with a large number of schools and masters attracted to the city, competing for students. Over the decades, the schools of Paris had many critics--monastic reformers, humanists, satirists, and moralists--and the focus of this book is the role such critics played in developing the schools into a university. Ferruolo argues that it was the educational values and ideas promoted by the critics--ideas of the unity of knowledge, the need to share learning freely and willingly, and the higher purposes and social importance of education--that first inspired the scholars of Paris to join together into a single guild. Their programs for educational reforms can be seen in the first set of statues promulgated for the nascent University of Paris in 1215.

"After the unexpected loss of his girlfriend, a teenage boy suffering from delusions is convinced that he can travel through time to see her"--

Based on the idea that there is a considerable difference between reality and discourse, the author points out that history is often reconstructed, adapted and sometimes mythicized from the perspectives of the present day, present states of mind and ideological concerns. The book closely examines historical culture and conscience in nineteenth and twentieth century Romania, particularly concentrating on the impact of the national ideology on history. Boia's innovative analysis identifies several key mythical configurations and shows how Romanians have reconstituted their own highly ideologized history over the last two centuries. The strength of *History and National Romanian Consciousness* lies in the author's ability to fully deconstruct the entire Romanian historiographic system and demonstrate the increasing acuteness of national problems in general, and in particular the exploitation of history to support national ideology.

The Schools of Paris and Their Critics, 1100-1215

Publica?ii ?i anun?uri. Partea a III-a

21 Lessons for the 21st Century

Exercises and Solutions

The Metaphors of Working Lives

Progresele ?tiin?ei

Renowned academics compare major features of imperial rule in the 19th century, reflecting a significant shift away from nationalism and toward empires in the studies of state building. The book responds to the current interest in multi-unit formations, such as the European Union and the expanded outreach of the United States. National historical narratives have systematically marginalized imperial dimensions, yet empires play an important role. This book examines the methods discerned in the creation of the Habsburg Monarchy, the Ottoman Empire, the Hohenzollern rule and Imperial Russia. It inspects the respective imperial elites in these empires, and it details the role of nations, religions and ideologies in the legitimacy of empire building, bringing the Spanish Empire into the analysis. The final part of the book focuses on modern empires, such as the German "Reich." The essays suggest that empires were more adaptive and resilient to change than is commonly thought. The story of a married woman who finds love in a country on the other side of the world. What would YOU choose? The stable marriage back home or the flame encountered on a vacation? >

Introduction to Pattern Recognition: A Matlab Approach is an accompanying manual to Theodoridis/Koutroumbas' Pattern Recognition. It includes Matlab code of the most common methods and algorithms in the book, together with a descriptive summary and solved examples, and including real-life data sets in imaging and audio recognition. This text is designed for electronic engineering, computer science, computer engineering, biomedical engineering and applied mathematics students taking graduate courses on pattern recognition and machine learning as well as R&D engineers and university researchers in image and signal processing/analysis, and computer vision. Matlab code and descriptive summary of the most common methods and algorithms in Theodoridis/Koutroumbas, Pattern Recognition, Fourth Edition Solved examples in Matlab, including real-life data sets in imaging and audio recognition Available separately or at a special package price with the main text (ISBN for package: 978-0-12-374491-3)

A Step-by-step Guide

Relative Finiteness in Module Theory

Analele științifice ale Universității "Al. I. Cuza" din Iași

Raw Foods and Herbs for Complete Cellular Regeneration**A Novel****God and Human Dignity**

An eye-opening introduction to the timelessly relevant ideas of Noam Chomsky, this book is a penetrating, illusion-shattering look at how things really work from the man The New York Times called “arguably the most important intellectual alive.” Offering something not found anywhere else: How the World Works is pure Chomsky, but tailored for those unfamiliar to his work. Made up of meticulously edited speeches and interviews, every dazzling idea and penetrating insight is kept intact and delivered in clear, accessible, reader-friendly prose. Originally published as four short books in the famous Real Story series—What Uncle Sam Really Wants; The Prosperous Few and the Restless Many; Secrets, Lies and Democracy; and The Common Good—they’ve collectively sold almost 600,000 copies. And they continue to sell year after year after year because Chomsky’s ideas become, if anything, more relevant as time goes by. For example, it was decades ago when he pointed out that “in 1970, about 90% of international capital was used for trade and long-term investment—more or less productive things—and 10% for speculation. By 1990, those figures had reversed.” As we know, high-risk speculation continues to increase exponentially as corporations continue to push the free market economy—but only for the power they offer to the wealthy, not to benefit all people. We’re paying the price now for not heeding him them.

Field-Effect and Bipolar Power Transistor Physics introduces the physics of operation of power transistors. It deals with bipolar devices as well as field-effect power transistors. The book provides an up-to-date account of the progress made in power transistor design. This volume consists of three parts. Part I examines general considerations and reviews semiconductor surface theory as a background to understanding surface phenomena. It also discusses the effect of high carrier concentration on the semiconductor properties. Part II deals with bipolar transistors and the basic structures of power transistors. Part III discusses junction field-effect and surface field-effect transistors. This book is written for electrical engineers who design power transistor circuits, device physicists and designers, and university students. The reader should have some familiarity with small signal transistor physics as the presentation is at the senior undergraduate or first-year graduate level.

This book contains fourteen articles that reflect current ideas on the phonology, morphology, and syntax of clitics. It covers the forms and functions of clitics in various typologically diverse languages and presents data from, e.g. European Portuguese, Macedonian, and Yoruba. It extensively deals with the prosodic structure of clitics, their morphological status, clitic placement, and clitic doubling. The form and behavior of clitics with respect to tonal phenomena and in verse are discussed in two articles (Akinlabi & Liberman, Reindl & Franks). Other articles address the prosodic representation of clitics in Irish (Green), the differences in the acquisition of clitics and strong pronouns in Catalan (Escobar & Gavarro), the similarities between clitics and affixes or words in Romance and Bantu languages (Cocchi, Crysmann, Monachesi, Ortman & Popescu), the semantics of clitics in the Greek DP and in Spanish doubling (Alexiadou & Stavrou, Uriagereka), and complex problems concerning verbal clitics in Romanian and Balkan languages (Legendre, Spencer, Tomic).

The Origins of the University

All the Lives We Never Lived

Computational Statistics Handbook with MATLAB

Dialogic Education and Technology

A Matlab Approach

Psychology of Gender

The authors have cleverly used exercises and their solutions to explore the concepts of multivariate data analysis. Broken down into three sections, this book has been structured to allow students in economics and finance to work their way through a well formulated exploration of this core topic. The first part of this book is devoted to graphical techniques. The second deals with multivariate random variables and presents the derivation of estimators and tests for various practical situations. The final section contains a wide variety of exercises in applied multivariate data analysis. Liu has written a comprehensive text on Web mining, which consists of two parts. The first part covers the data mining and machine learning foundations, where all the essential concepts and algorithms of data mining and machine learning are presented. The second part covers the key topics of Web mining, where Web crawling, search, social network analysis, structured data extraction, information integration, opinion mining and sentiment analysis, Web usage mining, query log mining, computational advertising, and recommender systems are all treated both in breadth and in depth. His book thus brings all the related concepts and algorithms together to form an authoritative and coherent text. The book offers a rich blend of theory and practice. It is suitable for students, researchers and practitioners interested in Web mining and data mining both as a learning text and as a reference book. Professors can readily use it for classes on data mining, Web mining, and text mining. Additional teaching materials such as lecture slides, datasets, and implemented algorithms are available online.

"The Corona crisis and the Need for a Great Reset" is a guide for anyone who wants to understand how COVID-19 disrupted our social and economic systems, and what changes will be needed to create a more inclusive, resilient and sustainable world going forward. Thierry Malleret, founder of the Monthly Barometer, and Klaus Schwab, founder and executive Chairman of the World Economic Forum, explore what the root causes of these crisis were, and why they lead to a need for a Great Reset. Theirs is a worrying, yet hopeful analysis. COVID-19 has created a great disruptive reset of our global social, economic, and political systems. But the power of human beings lies in being foresighted and having the ingenuity, at least to a certain extent, to take their destiny into their hands and to plan for a better future. This is the purpose of this book: to shake up and to show the deficiencies which were manifest in our global system, even before COVID broke out.