Chapter 16 Budgeting Chakarov

Big sister Gina is in a school play playing the queen of the universe and little brother wants to join in too. Helping her learn her lines seems boring as does making her costume - but then Gina gets the chicken pox and he has to step in.

This book constitutes the refereed proceedings of the 8th International Workshop on Hybrid Systems: Computation and Control, HSCC 2005, held in Zurich, Switzerland in March 2005. The 40 revised full papers presented together with 2 invited papers and the abstract of an invited talk were carefully reviewed and selected from 91 submissions. The papers focus on modeling, analysis, and implementation of dynamic and reactive systems involving both discrete and continuous behaviors. Among the topics addressed are tools for analysis and verification, control and optimization, modeling, engineering applications, and emerging directions in programming language support and implementation.

'Expenditure Policies Toward EU Accession' presents the set of public expenditures that could be conducive to rapid growth and convergence among the Central and Eastern European countries. This report assesses public expenditure policy objectives and provides best practice and lessons learned in designing expenditure reforms within these countries. It also highlights ways in which key expenditure programs such as education, environment, and transport can be redirected so as to be more fully supportive of growth objectives.

Meany Freeney is a bachelor farmer with simple needs and a healthy bank balance. His approach to life mirrors by his drinking habits - why buy a pint of Guinness when a half-pint, sipped slowly, gives twice the value? Trouble brews when an old flame arrives back in town. Her sparkle lights up his lonely world, but if he and the free-spending Julie are ever to marry, Meany must loosen his iron grip on the purse strings. Soon there is talk of fancy central heating, hot running water and even a gas cooker! But Meany has some cost-saving plans up his sleeve that should keep everyone happy. Or so he thinks...

This book provides a description of the main macroeconomic models used by the European Central Bank and the euro area national central banks (Eurosystem). These models are used to help prepare economic projections and scenario analysis for individual countries and the euro area as a whole. The volume takes stock of the current macroeconometric modelling infrastructure available within the Eurosystem, highlighting not only the structures and main features of the models used but also their purposes and underlying model-building philosophies. A bird s eye view of the key details of the design, structure and characteristics of the models is provided, along with information on the responses of these models to a series of standard economic and policy shocks. This is the first time that a comprehensive description and systematic comparison of the main macroeconomic models has been published. This book will be of great interest to Central Bank and government economists, as well as academics, economists and students with an interest in central banking, econometric modelling, forecasting and macroeconomic policy.

TEI'11: Fifth International Conference on Tangible, Embedded, and Embodied Interaction Jan 22, 2011-Jan 26, 2011 Funchal, Portugal. You can view more information about this proceeding and all of ACMs other published conference proceedings from the ACM Digital Library: http://www.acm.org/dl.

Microdevelopment is the process of change in abilities, knowledge and understanding during short time-spans. This book presents a new process-orientated view of development and learning based on recent innovations in psychology research. Instead of characterising abilities at different ages, researchers investigate processes of development and learning that evolve through time and explain what enables progress in them. Four themes are highlighted: variability, mechanisms that create transitions to higher levels of knowledge, interrelations between changes in the short-term scale of microdevelopment and the crucial effect of context. Learning and development are analysed in and out of school, in the individual's activities and through social interaction, in relation to simple and complex problems and in everyday behaviour and novel tasks. With contributions from the foremost researchers in the field Microdevelopment will be essential reading for all interested in cognitive and developmental science.

Increasing use of life insurance instruments and company-sponsored funds in France suggests that French households may be inclined to a greater reliance on financial savings as a source of retirement income. This paper examines the challenges imposed by an aging population on the pay-as-you-go basic and supplementary pension systems, the growth of life insurance and company-sponsored funds in the absence of a comprehensive legislation on prefunded pensions, and issues related to prefunding pension schemes, such as the possibility of an welfare enhancing transition to prefunding; effects on capital markets in view of the experience in other OECD countries; and the importance of the transportability of pensions and measures fostering competition in financial markets.

mmWave Massive MIMO: A Paradigm for 5G is the first book of its kind to hinge together related discussions on mmWave and Massive MIMO under the umbrella of 5G networks. New networking scenarios are identified, along with fundamental design requirements for mmWave Massive MIMO networks from an architectural and practical perspective. Working towards final deployment, this book updates the research community on the current mmWave Massive MIMO roadmap, taking into account the future emerging technologies emanating from 3GPP/IEEE. The book's editors draw on their vast experience in international research on the forefront of the mmWave Massive MIMO research arena and standardization. This book aims to talk openly about the topic, and will serve as a useful reference not only for postgraduates students to learn more on this evolving field, but also as inspiration for mobile communication researchers who want to make further innovative strides in the field to mark their legacy in the 5G arena. Contains tutorials on the basics of mmWave and Massive MIMO Identifies new 5G networking scenarios, along with design requirements from an architectural and practical perspective Details the latest updates on the evolution of the mmWave Massive MIMO roadmap, considering future emerging technologies emanating from 3GPP/IEEE Includes contributions from leading experts in the field in modeling and prototype design for mmWave Massive MIMO design Presents an ideal reference that not only helps postgraduate students learn more in this evolving field, but also inspires mobile communication researchers towards further innovation

This edited volume focuses on the links between the ongoing crisis in and around Ukraine, regional diversity, and the reform of decentralization. It provides in-depth insights into the historical constitution of regional diversity and the evolution of center-periphery relationships in Ukraine, the legal qualification of the conflict in Eastern Ukraine, and the role of the decentralization reform in promoting conflict resolution, as well as modernization, democratization and European integration of Ukraine. Particular emphasis lies on the securitization of both regional diversity issues and territorial self-government arrangements in terms of Russia's support for self-proclaimed Donetsk and Luhansk People's Republics. The volume captures the complexity of contemporary "hybrid" conflicts, involving both internal and external aspects, and the hybridization and securitization of territorial self-governance solutions. It thus provides an important contribution to the debate on territorial self-government and conflict resolution.

This paper reviews the theoretical and empirical literature on the effectiveness of fiscal policy. The focus is on the size of fiscal multipliers, and on the possibility that multipliers can turn negative (i.e., that fiscal contractions can be expansionary). The paper concludes that fiscal multipliers are overwhelmingly positive but small. However, there is some evidence of negative fiscal multipliers.

A unique international exercise in information-gathering and analysis An extraordinary confluence of global forces has kept the world economy strong in the past few years, but there are now numerous challenges to growth. The World Economic Outlook (WEO) presents the IMF's leading economists' analyses of global economic developments during the near and medium terms. It is a respected, one-stop, trusted resource offering remarkable insight, balance, and perspective to decision makers and policymakers worldwide. Published at least twice yearly, the World Economic Outlook presents the outlook for growth, inflation, trade, and other economic developments in a clear, practical format. Each WEO considers the issues affecting advanced and emerging economies. The analytic chapters provide the global intelligence required to deal with global interdependence. These analyses focus on pressing concerns or hotly debated issues, putting prospects for liquidity, inflation, and growth into context. The statistical appendix presents historical data as well as projections and selected series from World Economic Outlook database updated for each report. The October 2008 edition examines commodity prices and inflation, economic cycles in the aftermath of financial crises, the role of fiscal policy during downturns, and current account imbalances in emerging economies. Recent analytic chapters have examined climate change, the housing cycle, commodity prices, capital inflows, globalization and inequality, and the global business cycle.

Monotonic Optimization in Communication and Networking Systems provides a succinct and accessible introduction to monotonic optimization, including formulation skills and solution algorithms. Through several application examples, it illustrates modeling techniques and algorithm details of monotonic optimization in various scenarios.

The Secret Life of Tigers documents the family life of three tigresses and their cubs at every stage of the cubs' development, from soon after birth to adulthood. Presenting extraordinary discoveries about the lives of tigers, with the role of the father recorded in the wild for the first time, this enhanced second edition passionately argues for greater involvement of the government and the general public to save the tiger as it battles extinction in thenear future.

A central tenet of the Maastricht Treaty is that a successful European Monetary Union requires sustainable public finances of its member states, yet there is no clear definition of sustainability. This book develops a concept of sustainability focusing on the controllability of public finances. After reviewing the theoretical and empirical arguments for a disaggregate and institutions-oriented approach to correcting non-sustainable deficits, the authors propose a practical procedure to assess the sustainability of a country's public finances.

This book explores Dental Stem Cell (DSC) biology, from a review of basic concepts for cell culture, to isolation, self-renewal, multipotency and differentiation, regulation by molecular medicine, and prospective research areas for regenerative medicine. The first seven chapters delve into basic DSC properties, vital signaling pathways involved in differentiation, pluripotency, iPS cell development from DSCs, and genetic engineering approaches of DSCs in accordance with the current literature. A comprehensive review of possible clinical applications and in vitro/in vivo studies follows, illustrating the future of DSC research for in the tissue engineering field. The text also discusses the political, ethical, social, and legal ramifications of the use of dental stem cells. Expertly authored and drawing from a multitude of international perspectives, Dental Stem Cells is an invaluable addition to Springer's Stem Cell Biology and Regenerative Medicine series. It is essential reading for advanced graduate students, basic researchers, and clinical investigators in the fields of stem cell therapy, biological sciences of dentistry, and regenerative medicine.

Beginning in 1984, Eric Dinerstein led a team directly responsible for the recovery of the greater one-horned rhinoceros in the Royal Chitwan National Park in Nepal, where the population had once declined to as few as 100 rhinos. The Return of the Unicorns is an account of what it takes to save endangered large mammals. In its pages, Dinerstein outlines the multifaceted recovery program—structured around targeted fieldwork and scientific research, effective protective measures, habitat planning and management, public-awareness campaigns, economic incentives to promote local guardianship, and bold, uncompromising leadership—that brought these extraordinary animals back from the brink of extinction. In an age when scientists must also become politicians, educators, fund-raisers, and activists to safeguard the subjects that they study, Dinerstein's inspiring story offers a successful model for large-mammal conservation that can be applied throughout Asia and across the globe.

Provides concise, yet authoritative descriptions of the most common techniques used to study wild carnivores and to conserve and manage their populations within increasingly human-dominated landscapes.

Weightless Wealth provides you with the practical tools to identify, assess and evaluate these intangible assets, and helps you to leverage them to their full potential, creating a

high-growth, high-performance company.

Annotation A study of impediments to investment and private sector development in Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the former Yugoslav Republic of Macedonia, Moldova, Romania, and Serbia and Montenegro, this title yields fundamental new insights for improving the region's business environment, economic development, and prospects for growth. It is a collaborative effort between the World Bank and the European Bank for Reconstruction and Development that offers important practical ideas for all policymakers and observers concerned with the future of South Eastern Europe. It makes concrete recommendations for reforms that would ease the constraints on domestic and foreign investment, an essential step in sustaining growth and reducing poverty in the region.

Mandatory pensions are a worldwide phenomenon. However, with fixed contribution rates, monthly benefits, and retirement ages, pension systems are not consistent with three long-run trends: declining mortality, declining fertility, and earlier retirement. Many systems need reform. This book gives an extensive nontechnical explanation of the economics of pension design. The theoretical arguments have three elements: * Pension systems have multiple objectives--consumption smoothing, insurance, poverty relief, and redistribution. Good policy needs to bear them all in mind. * Good analysis should be framed in a second-best context-- simple economic models are a bad guide to policy design in a world with imperfect information and decision-making, incomplete markets and taxation. * Any choice of pension system has risk-sharing and distributional consequences, which the book recognizes explicitly. Barr and Diamond's analysis includes labor markets, capital markets, risk sharing, and gender and family, with comparison of PAYG and funded systems, recognizing that the suitable level of funding differs by country. Alongside the economic principles of good design, policy must also take account of a country's capacity to implement the system. Thus the theoretical analysis is complemented by discussion of implementation, and of experiences, both good and bad, in many countries, with particular attention to Chile and China.

The fifth generation of mobile communication systems (5G) is nowadays a reality. 5G networks are been deployed all over the world, and the first 5G-capable devices (e.g., smartphones, tablets, wearable, etc.) are already commercially available. 5G systems provide unprecedented levels of connectivity and quality of service (QoS) to cope with the incessant growth in the number of connected devices and the huge increase in data-rate demand. Massive MIMO (multiple-input multiple-output) technology plays a key role in 5G systems. The underlying principle of this technology is the use of a large number of co-located antennas at the base station, which coherently transmit/receive signals to/from multiple users. This signal co-processing at multiple antennas leads to manifold benefits: array gain, spatial diversity and spatial user multiplexing. These elements enable to meet the QoS requirements established for the 5G systems. The major bottleneck of massive MIMO systems as well as of any cellular network is the inter-cell interference, which affects significantly the cell-edge users, whose performance is already degraded by the path attenuation. To overcome these limitations and provide uniformly excellent service to all the users we need a more radical approach: we need to challenge the cellular paradigm. In this regard, cell-free massive MIMO constitutes the paradigm shift. In the cell-free paradigm, it is not the base station surrounded by the users, but rather it is each user being surrounded by smaller, simpler, serving base stations referred to as access points (APs). In such a system, each user experiences being in the cell-center, and it does not experience any cell boundaries. Hence, the terminology cell-free. As a result, users are not affected by inter-cell interference, and the path attenuation is significantly reduced due to the presence of many APs in their proximity. This leads to impressive performance. Although appealing from the performance viewpoint, the designing and implementation of such a distributed massive MIMO system is a challenging task, and it is the object of this thesis. More specifically, in this thesis we study: Paper A) The large potential of this promising technology in realistic indoor/outdoor scenarios while also addressing practical deployment issues, such as clock synchronization among APs, and cost-efficient implementations. We provide an extensive description of a cell-free massive MIMO system, emphasizing strengths and weaknesses, and pointing out differences and similarities with existing distributed multiple antenna systems, such as Coordinated MultiPoint (CoMP). Paper B) How to preserve the scalability of the system, by proposing a solution related to data processing, network topology and power control. We consider a realistic scenario where multiple central processing units serve disjoint subsets of APs, and compare the spectral efficiency provided by the proposed scalable framework with the canonical cell-free massive MIMO and CoMP. Paper C) How to improve the spectral efficiency (SE) in the downlink (DL), by devising two distributed precoding schemes, referred to as local partial zero-forcing (ZF) and local protective partial ZF, that provide an adaptable trade-off between interference cancelation and boosting of the desired signal, with no additional front-haul overhead, and that are implementable by APs with very few antennas. We derive closed-form expressions for the achievable SE under the assumption of independent Rayleigh fading channel, channel estimation error and pilot contamination. These closed-form expressions are then used to devise optimal max-min fairness power control. Paper D) How to further improve the SE by letting the user estimate the DL channel from DL pilots, instead of relying solely on the knowledge of the channel statistics. We derive an approximate closed-form expression of the DL SE for conjugate beamforming (CB), and assuming independent Rayleigh fading. This expression accounts for beamformed DL pilots, estimation errors and pilot contamination at both the AP and the user side. We devise a sequential convex approximation algorithm to globally solve the max-min fairness power control optimization problem, and a greedy algorithm for uplink (UL) and DL pilot assignment. The latter consists in jointly selecting the UL and DL pilot pair, for each user, that maximizes the smallest SE in the network. Paper E) A precoding scheme that is more suitable when only the channel statistics are available at the users, referred to as enhanced normalized CB. It consists in normalizing the precoding vector by its squared norm in order to reduce the fluctuations of the effective channel seen at the user, and thereby to boost the channel hardening. The performance achieved by this scheme is compared with the CB scheme with DL training (described in Paper D). Paper F) A

maximum-likelihood-based method to estimate the channel statistics in the UL, along with an accompanying pilot transmission scheme, that is particularly useful in line-of-sight operation and in scenarios with resource constraints. Pilots are structurally phase-rotated over different coherence blocks to create an effective statistical distribution of the received pilot signal that can be efficiently exploited by the AP when performing the proposed estimation method. The overall conclusion is that cell-free massive MIMO is not a utopia, and a practical, distributed, scalable, high-performance system can be implemented. Today it represents a hot research topic, but tomorrow it might represent a key enabler for beyond-5G technology, as massive MIMO has been for 5G. La quinta generazione dei sistemi radiomobili cellulari (5G) è oggi una realtà. Le reti 5G si stanno diffondendo in tutto il mondo e i dispositivi 5G (ad esempio smartphones, tablets, indossabili, ecc.) sono già disponibili sul mercato. I sistemi 5G garantiscono livelli di connettività e di qualità di servizio senza precedenti, per fronteggiare l'incessante crescita del numero di dispositivi connessi alla rete e della domanda di dati ad alta velocità. La tecnologia Massive MIMO (multiple-input multiple-output) riveste un ruolo fondamentale nei sistemi 5G. Il principio alla base di questa tecnologia è l'impiego di un elevato numero di antenne collocate nella base station (stazione radio base) le quali trasmettono/ricevono segnali, in maniere coerente, a/da più terminali utente. Questo co-processamento del segnale da parte di più antenne apporta molteplici benefici: guadagno di array, diversità spaziale e multiplazione degli utenti nel dominio spaziale. Questi elementi consentono di raggiungere i requisiti di servizio stabiliti per i sistemi 5G. Tuttavia, il limite principale dei sistemi massive MIMO, così come di ogni rete cellulare, è rappresentato dalla interferenza inter-cella (ovvero l'interferenza tra aree di copertura gestite da diverse base stations), la quale riduce in modo significativo le performance degli utenti a bordo cella, già degradate dalle attenuazioni del segnale dovute alla considerevole distanza dalla base station. Per superare queste limitazioni e fornire una qualità del servizio uniformemente eccellente a tutti gli utenti, è necessario un approccio più radicale e guardare oltre il classico paradigma cellulare che caratterizza le attuali architetture di rete. A tal proposito, cell-free massive MIMO (massive MIMO senza celle) costituisce un cambio di paradigma: ogni utente è circondato e servito contemporaneamente da numerose, semplici e di dimensioni ridotte base stations, denominate access points (punti di accesso alla rete). Gli access points cooperano per servire tutti gli utenti nella loro area di copertura congiunta, eliminando l'interferenza inter-cella e il concetto stesso di cella. Non risentendo più dell'effetto "bordo-cella", gli utenti possono usufruire di qualità di servizio e velocità dati eccellenti. Sebbene attraente dal punto di vista delle performance, l'implementazione di un tale sistema distribuito è una operazione impegnativa ed è oggetto di questa tesi. Piu specificatamente, questa tesi di dottorato tratta: Articolo A) L'enorme potenziale di questa promettente tecnologia in scenari realistici sia indoor che outdoor, proponendo anche delle soluzioni di implementazione flessibili ed a basso costo. Articolo B) Come preservare la scalabilità del sistema, proponendo soluzioni distribuite riguardanti il processamento e la condivisione dei dati, l'architettura di rete e l'allocazione di potenza, ovvero come ottimizzare i livelli di potenza trasmessa dagli access points per ridurre l'interferenza tra utenti e migliorare le performance. Articolo C) Come migliorare l'efficienza spettrale in downlink (da access point verso utente) proponendo due schemi di pre-codifica dei dati di trasmissione, denominati local partial zero-forcing (ZF) e local protective partial ZF, che forniscono un perfetto compromesso tra cancellazione dell'interferenza tra utenti ed amplificazione del segnale desiderato. Articolo D) Come migliorare l'efficienza spettrale in downlink permettendo al terminale utente di stimare le informazioni sulle condizioni istantanee del canale da sequenze pilota, piuttosto che basarsi su informazioni statistiche ed a lungo termine, come convenzionalmente previsto. Articolo E) In alternativa alla soluzione precedente, uno schema di pre-codifica che è più adatto al caso in cui gli utenti hanno a disposizione esclusivamente informazioni statistiche sul canale per poter effettuare la decodifica dei dati. Articolo F) Un metodo per permettere agli access points di stimare, in maniera rapida, le condizioni di canale su base statistica, favorito da uno schema di trasmissione delle sequenze pilota basato su rotazione di fase. Realizzare un sistema cell-free massive MIMO pratico, distribuito, scalabile e performante non è una utopia. Oggi questo concept rappresenta un argomento di ricerca interessante, attraente e stimolante ma in futuro potrebbe costituire un fattore chiave per le tecnologie post-5G, proprio come massive MIMO lo è stato per il 5G. Den femte generationens mobilkommunikationssystem (5G) är numera en verklighet. 5G-nätverk är utplacerade på ett flertal platser världen över och de första 5G-kapabla terminalerna (såsom smarta telefoner, surfplattor, kroppsburna apparater, etc.) är redan kommersiellt tillgängliga. 5G-systemen kan tillhandahålla tidigare oöverträffade nivåer av uppkoppling och servicekvalitet och är designade för en fortsatt oavbruten tillväxt i antalet uppkopplade apparater och ökande datataktskrav. Massiv MIMO-teknologi (eng: multiple-input multiple-output) spelar en nyckelroll i dagens 5G-system. Principen bakom denna teknik är användningen av ett stort antal samlokaliserade antenner vid basstationen, där alla antennerna sänder och tar emot signaler faskoherent till och från flera användare. Gemensam signalbehandling av många antennsignaler ger ett flertal fördelar, såsom hög riktverkan via lobformning, vilket leder till högre datatakter samt möjliggör att flera användare utnyttjar samma radioresurser via rumslig användarmultiplexering. Eftersom en signal kan gå genom flera olika, möjligen oberoende kanaler, så utsätts den för flera olika förändringar samtidigt. Denna mångfald ökar kvaliteten på signalen vid mottagaren och förbättrar radiolänkens robusthet och tillförlitlighet. Detta gör det möjligt att uppfylla de höga kraven på servicekvalitet som fastställts för 5G-systemen. Den största begränsningen för massiva MIMO-system såväl som för alla cellulära mobilnätverk, är störningar från andra celler som påverkar användare på cellkanten väsentligt, vars prestanda redan begränsas av sträckdämpningen på radiokanalen. För att övervinna dessa begränsningar och för att kunna tillhandahålla samma utmärkta servicekvalitet till alla användare behöver vi ett mer radikalt angreppssätt: vi måste utmana cellparadigmet. I detta avseende utgör cellfri massiv-MIMO teknik ett paradigmskifte. I cellfri massive-MIMO är utgångspunkten inte att basstationen är omgiven av användare som den betjänar, utan snarare att varje användare omges av basstationer som de betjänas av. Dessa basstationer, ofta mindre och enklare, kallas accesspunkter (AP). I ett sådant system upplever varje användare att den befinner sig i centrum av systemet och ingen användare upplever några cellgränser. Därav terminologin cellfri. Som ett resultat av detta påverkas inte

användarna av inter-cellstörningar och sträckdämpningen reduceras kraftigt på grund av närvaron av många accesspunkter i varje användares närhet. Detta leder till imponerande prestanda. Även om det är tilltalande ur ett prestandaperspektiv så är utformningen och implementeringen av ett sådant distribuerat massivt MIMO-system en utmanande uppgift, och det är syftet med denna avhandling att studera detta. Mer specifikt studerar vi i denna avhandling: A) den mycket stora potentialen med denna teknik i realistiska inomhus- såväl som utomhusscenarier, samt hur man hanterar praktiska implementeringsproblem, såsom klocksynkronisering bland accesspunkter och kostnadseffektiva implementeringar; B) hur man ska uppnå skalbarhet i systemet genom att föreslå lösningar relaterade till databehandling, nätverkstopologi och effektkontroll; C) hur man ökar datahastigheten i nedlänken med hjälp av två nyutvecklade distribuerade överföringsmetoder som tillhandahåller en avvägning mellan störningsundertryckning och förstärkning av önskade signaler, utan att öka mängden intern signalering till de distribuerade accesspunkterna, och som kan implementeras i accesspunkter med mycket få antenner; D) hur man kan förbättra prestandan ytterligare genom att låta användaren estimera nedlänkskanalen med hjälp av nedlänkspiloter, istället för att bara förlita sig på kunskap om kanalstatistik; E) en överföringsmetod för nedlänk som är mer lämpligt när endast kanalstatistiken är tillgänglig för användarna. Prestandan som uppnås genom detta schema jämförs med en utökad variant av den nedlänk-pilotbaserade metoden (beskrivet i föregående punkt); F) en metod för att uppskatta kanalstatistiken i upplänken, samt en åtföljande pilotsändningsmetod, som är särskilt användbart vid direktvägsutbredning (line-of-sight) och i scenarier med resursbegränsningar. Den övergripande slutsatsen är att cellfri massiv MIMO inte är en utopi, och att ett distribuerat, skalbart, samt högpresterande system kan implementeras praktiskt. Idag representerar detta ett hett forskningsämne, men snart kan det visa sig vara en viktig möjliggörare för teknik bortom dagens system, på samma sätt som centraliserad massiv MIMO har varit för de nya 5G-systemen.

On 25 September 2015, countries adopted a set of 17 goals to end poverty, protect the planet, and ensure prosperity for all as part of a new sustainable development agenda to be achieved by 2030. For the goals to be reached, everyone needs to do their part: governments, the private sector, civil society and people like you. Elyx, the United Nations' digital ambassador, uses various expressions and actions to help demonstrate the meaning of each goal. Created by French artist YAK, Elyx has no race, sex or nationality and is a universal character promoting the importance of the United Nations' work.

You don't need to buy expensive statistical software like SPSS. This book teaches you R (R can be downloaded for free), People Analytics, Social Media Analytics, Text Mining and Sentiment Analysis. It is written for people with absolutely NO knowledge of R programming, with step-by-step print-screen instructions. The sample R codes are kept simple & short so that you are not overwhelmed with too much unnecessary information, and focuses on teaching you the R codes relevant to people analytics, so that you'll be up-and-running in no time. If you are new to R programming, this is the book for you. As R is developed specially for statistical analysis, you can run complicated statistical number crunching (Correlation, Multiple & Logistic Regression, etc.) by simply entering a few commands. This book covers the full People Analytics scope (Benefits, Compensation, Culture, Diversity & Inclusion, Engagement, Leadership, Learning & Development, Personality Traits, Performance Management, Recruitment, Sales Incentives) with numerous real-world examples, and shows how R programming can help you: 1) Run Social Media Analytics, Text mining & Sentiment Analysis with R. 2) Predict employees' flight-risk using R's Correlation & Logistic Regression function. 3) Identify the personality traits of top performing Customer Service staff and Sales staff using R's correlation function. 4) Predict impact of Employee Engagement on Customer Satisfaction, Revenue and Shareholder Returns, etc. using R's Correlation & Multiple Regression function. 5) Predict impact of Learning & Development on Sales, using R's Multiple Regression function. 6) Predict Diversity & Inclusion's impact on Revenue and EBIT using R's Multiple Regression function.

The Multilateral Instrument (MLI) proposed in OECD BEPS Action 15 will lead to the modification of numerous tax treaties. As tax treaties can have different wording, terminology and structure, a great challenge is to find a proper way to accomplish their modification without distorting the underlying framework or triggering undesirable effects. This book analyses the MLI, which was signed by over seventy jurisdictions on 7 June 2017. The topics covered include: • the procedural mechanisms on how the new measures to prevent base erosion and profit shifting (BEPS) will interact with and complement existing tax treaties; • the scope of the MLI in order to ascertain which tax treaties and taxes are covered; • the interpretation of terms used in the MLI and the relationship between the languages used in the MLI and in the particular tax treaties; • the implementation of the minimum standard through the MLI, as well as how states can exercise various options offered by the MLI and reserve the right not to apply certain provisions of the MLI; • the legal consequences of the exercise of options and reservations for the other states; • the notification procedure through which states declare their choices; and • the possibilities and procedure for withdrawal from the obligations entered into upon signing the MLI. Finally, the book discusses whether the mechanism of the MLI can serve as a role model for future changes to the OECD Model Convention. The book incorporates the analyses of leading scholars and practitioners dealing with international tax matters. Critical insights are offered for academics, practitioners, tax officials and judges who deal with or are interested in the field of international taxation.

In 1985 the Media Lab was created at MIT to advance the idea that computation would give rise to a new science of expressive media. Within the media lab, the Epistemology and Learning group extends the traditional definition of media by treating as expressive media materials with which children play and learn. The Group's work follows a paradigm for learning research called Constructionism. Several of the chapters directly address the theoretical formulation of Constructionism, and others describe experimental studies which enrich and confirm different aspects of the idea. Thus this volume can be taken as the most extensive and definitive statement to date of this approach to media and

education research and practice. This book is structured around four major themes: learning through designing and programming; epistemological styles in constructionist learning, children and cybernetics; and video as a research tool for exploring and documenting constructionist environments.

The concept of fiscal impulse is defined, discussed, and differentiated from measures that attempt to summarize the macroeconomic effects of fiscal policy. Two methodologies are briefly discussed and their corresponding measures presented for the G-7 countries over the ten-year period ending in 1989. Controversies about the measure are highlighted and potential improvements are also discussed.

Information usually has the highest value when it is fresh. For example, real-time knowledge about the location, orientation, and speed of motor vehicles is imperative in autonomous driving, and the access to timely information about stock prices and interest rate movements is essential for developing trading strategies on the stock market. The Age of Information (AoI) concept, together with its recent extensions, provides a means of quantifying the freshness of information and an opportunity to improve the performance of real-time systems and networks. Recent research advances on AoI suggest that many well-known design principles of traditional data networks (for, e.g., providing high throughput and low delay) need to be re-examined for enhancing information freshness in rapidly emerging real-time applications. This book provides a suite of analytical tools and insightful results on the generation of information-update packets at the source nodes and the design of network protocols forwarding the packets to their destinations. The book also points out interesting connections between AoI concept and information theory, signal processing, and control theory, which are worthy of future investigation.

Randomized algorithms have become a central part of the algorithms curriculum, based on their increasingly widespread use in modern applications. This book presents a coherent and unified treatment of probabilistic techniques for obtaining high probability estimates on the performance of randomized algorithms. It covers the basic toolkit from the Chernoff–Hoeffding bounds to more sophisticated techniques like martingales and isoperimetric inequalities, as well as some recent developments like Talagrand's inequality, transportation cost inequalities and log-Sobolev inequalities. Along the way, variations on the basic theme are examined, such as Chernoff–Hoeffding bounds in dependent settings. The authors emphasise comparative study of the different methods, highlighting respective strengths and weaknesses in concrete example applications. The exposition is tailored to discrete settings sufficient for the analysis of algorithms, avoiding unnecessary measure-theoretic details, thus making the book accessible to computer scientists as well as probabilists and discrete mathematicians.

Despite intense calls for safeguarding public investment in Europe, public investment expenditure, when measured in relation to GDP, has steadily fallen in the last three decades, evoking fears that economic activity may be correspondingly negatively affected. At the same time, however, public consumption in the EU-12 countries has trended up. In this paper, we provide a macroeconomic assessment of the observed change in the composition of public spending in the euro area in a medium-scale two-country dynamic stochastic general equilibrium (DSGE) model. First, we identify the channels through which both temporary and permanent public investment shocks generate larger fiscal multipliers than exogenous increases in public consumption. Second, we quantify the negative impact of a change in fiscal stance, characterized by a permanent rise in public consumption and a permanent fall in public investment, keeping the overall level of public spending constant. The key message of the paper is that calls for reversing the observed trend in the composition of public spending are well justified.

This paper studies how the composition of fiscal adjustments influences their likelihood of "success", defined as a long lasting deficit reduction, and their macroeconomic consequences. We find that fiscal adjustments which rely primarily on spending cuts on transfers and the government wage bill have a better chance of being successful and are expansionary. On the contrary fiscal adjustments which rely primarily on tax increases and cuts in public investment tend not to last and are contractionary. We discuss alterative explanations for these findings by studying both a full sample of OECD countries and by focusing on three case studies: Denmark, Ireland and Italy.

The standard reference for fixed income portfolio managers Despite their conservative nature, fixed income instruments are among the investment industry's most complex and potentially risky investments. Fixed Income Mathematics is recognized worldwide as the essential professional reference for understanding the concepts and evaluative methodologies for bonds, mortgage-backed securities, asset-backed securities, and other fixed income instruments. This fully revised and updated fourth edition features all-new illustrations of the future and present value of money, with appendices on continuous compounding and new sections and chapters addressing risk measures, cash flow characteristics of credit-sensitive mortgage-backed and asset-backed securities, and more.

Concentration of Measure for the Analysis of Randomized AlgorithmsCambridge University Press

Coded Computing presents a novel method of computing that uses coding theory to overcome major bottlenecks in large-scale machine learning and big data analytics computing systems.

A Comprehensive Guide to All Aspects of Fixed Income Securities Fixed Income Securities, Second Edition sets the standard for a concise, complete explanation of the dynamics and opportunities inherent in today's fixed income marketplace. Frank Fabozzi combines all the various aspects of the fixed income market, including valuation, the interest rates of risk measurement, portfolio factors, and qualities of individual sectors, into an all-inclusive text with one cohesive voice. This comprehensive guide provides complete coverage of the wide range of fixed income securities, including: * U.S. Treasury securities * Agencies * Municipal securities * Asset-backed securities * Corporate and international bonds * Mortgage-backed securities, including CMOs * Collateralized debt obligations (CDOs) For the financial professional who needs to understand the fundamental and unique characteristics of fixed income securities, Fixed Income Securities, Second Edition offers the most up-to-date facts and formulas needed to navigate today's fast-changing financial markets. Increase your knowledge of this market and enhance your financial performance over the long-term with Fixed Income Securities, Second Edition. www.wileyfinance.com

A strong reference on the problem of signal and speech enhancement, describing the newest developments in this exciting field. The general emphasis is on noise reduction, because of the large number of applications that can benefit from this technology.

The Annual Report 2008 to the Board of Governors reviews the IMF's activities and policies during the financial year (May 1, 2007, through April 30, 2008). There are five chapters: (1) Overview: Refocusing the IMF; (2) Developments in the Global Economy and Financial Markets; (3) Fostering Macroeconomic and Financial Stability and Growth Through Surveillance; (4) Program Support and Capacity Building; and (5) Governance, Organization, and Finances. The full financial statements for the year, other appendixes, and materials supplementing the text are provided on a CD-ROM.