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Fundamental Neuroscience-Larry Squire 2008-04-02 Fundamental Neuroscience, 3rd Edition introduces graduate and upper-level undergraduate students to the full range of contemporary neuroscience. Addressing instructor and student feedback on the previous edition, all of the chapters are rewritten to make this book more concise and student-friendly than ever before. Each chapter is once again heavily illustrated and provides clinical boxes describing experiments, disorders, and methodological approaches and concepts. Capturing the promise and excitement of this fast-moving field, Fundamental Neuroscience, 3rd Edition is the text that students will be able to reference throughout their neuroscience careers! New to this edition: 30% new material including new chapters on Dendritic Development and Spine Morphogenesis, Chemical Senses, Cerebellum, Eye Movements, Circadian Timing, Sleep and Dreaming, and Consciousness Additional text boxes describing key experiments, disorders, methods, and concepts Multiple model system coverage beyond rats, mice, and monkeys Extensively expanded index for easier referencing

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Fundamental Neuroscience-Larry Squire 2002-11-19 With over 300 training programs in neuroscience currently in existence, demand is great for a comprehensive textbook that both introduces graduate students to the full range of neuroscience, from molecular biology to clinical science, but also assists instructors in offering an in-depth course in neuroscience to advanced undergraduates. The second edition of Fundamental Neuroscience accomplishes all this and more. The thoroughly revised text features over 25% new material including completely new chapters, illustrations, and a CD-ROM containing all the figures from the text. More concise and manageable than the previous edition, this book has been retooled to better serve its audience in the neuroscience and medical communities. Key Features * Logically organized into 7 sections, with uniform editing of the content for a "one-voice" feel throughout all 54 chapters * Includes numerous text boxes with concise, detailed descriptions of specific experiments, disorders, methodological approaches, and concepts * Well-illustrated with over 850 full color figures, also included on the accompanying CD-ROM

Fundamental Neuroscience for Basic and Clinical Applications,with STUDENT CONSULT Online Access,4-Duane E. Haines 2013 Turn to Fundamental Neuroscience for a thorough, clinically relevant understanding of this complicated subject! Integrated coverage of neuroanatomy, physiology, and pharmacology, with a particular emphasis on systems neurobiology, effectively prepares you for your courses, exams, and beyond. Easily comprehend and retain complex material thanks to the expert instruction of Professor Duane Haines, recipient of the Henry Gray/Elsevier Distinguished Teacher Award from the American Association of Anatomists and the Distinguished Teacher Award from the Association of American Colleges. Access the complete contents online at www.studentconsult.com, plus 150 USMLE-style review questions, sectional images correlated with the anatomical diagrams within the text, and more. Grasp important anatomical concepts and their clinical applications thanks to correlated state-of-the-art imaging examples, anatomical diagrams, and histology photos. Retain key information and efficiently study for your exams with clinical highlights integrated and emphasized within the text.

Fundamentals of Cognitive Neuroscience-Bernard J. Baars 2013 This introductory text offers a comprehensive and easy-to-follow guide to cognitive neuroscience. Chapters cover all aspects of the field - the neural framework, sight, sound, consciousness, learning/memory, problem solving, speech, executive control, emotions, socialization and development - in a student-friendly format with extensive pedagogy and ancillaries to aid both the student and professor. Throughout the text, case studies and everyday examples are used to help students understand the more challenging aspects of the material. Written by two leading experts in the field, the text takes a unique thematic approach, guiding students along a clear path to understand the latest findings whether or not they have a background in neuroscience. Complete introduction to mind-brain science, written to be highly accessible to undergraduates with limited neuroscience training Richly illustrated with carefully selected color graphics to enhance understanding Enhanced pedagogy highlights key concepts for the student and aids in teaching - chapter outlines, study questions, glossary Ancillary support saves instructors time and facilitates learning - test questions, image collection, lecture slides, etc.

Fundamental Neuroscience for Basic and Clinical Applications E-Book-Duane E. Haines 2017-08-17 Using a rigorous yet clinically-focused approach, Fundamental Neuroscience for Basic and Clinical Applications, 5th Edition, covers the fundamental neuroscience information needed for coursework, exams, and beyond. It integrates neuroanatomy, pharmacology, and physiology, and offers a full section devoted to systems neurobiology, helping you comprehend and retain the complex material you need to know. Highlights clinical content in blue throughout the text, helping you focus on what you need to know in the clinical environment. Presents thoroughly updated information in every chapter, with an emphasis on new clinical thinking as related to the brain and systems neurobiology. Features hundreds of correlated state-of-the-art imaging examples, anatomical diagrams, and histology photos – nearly half are new or improved for this edition. Pays special attention to the correct use of clinical and anatomical terminology, and provides new clinical text and clinical-anatomical correlations.

Multisensory Flavor Perception-Betina Piqueras-Fiszman 2016-04-14 Multisensory Flavor Perception: From Fundamental Neuroscience Through to the Marketplace provides state-of-the-art coverage of the latest insights from the rapidly-expanding world of multisensory flavor research. The book highlights the various types of crossmodal interactions, such as sound and taste, and vision and taste, showing their impact on sensory and hedonic perception, along with their consumption in the context of food and drink. The chapters in this edited volume review the existing literature, also explaining the underlying neural and psychological mechanisms which lead to crossmodal perception of flavor. The book brings together research which has not been presented before, making it the first book in the market to cover the literature of multisensory flavor perception by incorporating the latest in psychophysics and neuroscience. Authored by top academics and world leaders in the field Takes readers on a journey from the neurological underpinnings of multisensory flavor perception, then presenting insights that can be used by food companies to create better flavor sensations for consumers Offers a wide perspective on multisensory flavor perception, an area of rapidly expanding knowledge

Fundamentals of Computational Neuroscience-Thomas Trappenberg 2010 The new edition of Fundamentals of Computational Neuroscience build on the success and strengths of the first edition. It introduces the theoretical foundations of neuroscience with a focus on the nature of information processing in the brain. The book covers the introduction and motivation of simplified models of neurons that are suitable for exploring information processing in large brain-like networks. Additionally, it introduces several fundamental networkarchitectures and discusses their relevance for information processing in the brain, giving some examples of models of higher-order cognitive functions to demonstrate the advanced insight that can begained with such studies.

Neuroscience-Laurie Lundy-Ekman 2002 Written with rehabilitation professionals in mind, this work connects neuroscience theory to clinical application with stories written by real people with neurological disorders and case studies summarizing key features of neurological disorders.

Fundamental Neuroscience for Basic and Clinical Applications-Duane E. Haines 2006 Provides thorough explanations of cellular biology, neuron structure and function, vascular anatomy, neuronal communication, and the embryological development of the nervous system. Discusses human regional neuroanatomy and systems neurobiology, providing an understanding of the function of the human brain and spinal cord. Includes numerous diagnostic imaging examples--including MR and CT imaging studies--that provide radiological correlations for various neuroanatomical structures.

Nutritional Neuroscience-Harris R. Lieberman 2005-03-18 Scientific and commercial interest in the field of nutritional neuroscience has grown immensely over the last decade. Today, a broad range of dietary supplements, foods for weight loss, functional foods, nutraceuticals, and medical foods are widely available. Many of these products are marketed for their effects on behavior or brain function, which relates directly to nutritional neuroscience and raises issues regarding their safety and efficacy. The only comprehensive reference on this subject, Nutritional Neuroscience discusses the relationship of nutrition to behavior and neuroscience. Following a review of fundamental issues and methods, the book covers the effects of macronutrients and micronutrients on brain function and behavior. Chapters are devoted to the effects of a wide range of foods, specific nutrients, food constituents, and food additives on cognitive behavior and development. The final section examines foods and supplements that modulate brain function. With a broad range of information presented in a simple and straightforward manner, this book provides an ideal introduction to nutritional neuroscience. The depth of information and comprehensive coverage also make this an essential reference for specialists involved in nutrition, neuroscience, pharmacology, psychology, and related disciplines.

Foundational Concepts in Neuroscience: A Brain-Mind Odyssey (Norton Series on Interpersonal Neurobiology)-David E. Presti 2015-12-14 Key concepts in neuroscience presented for the non-medical reader. A fresh take on contemporary brain science, this book presents neuroscience—the scientific study of brain, mind, and behavior—in easy-to-understand ways with a focus on concepts of interest to all science readers. Rigorous and detailed enough to use as a textbook in a university or community college class, it is at the same time meant for any and all readers, clinicians and non-clinicians alike, interested in learning about the foundations of contemporary brain science. From molecules and cells to mind and consciousness, the known and the mysterious are presented in the context of the history of modern biology and with an eye toward better appreciating the beauty and growing public presence of brain science.

Guide to Research Techniques in Neuroscience-Matt Carter 2015-02-27 Neuroscience is, by definition, a multidisciplinary field: some scientists study genes and proteins at the molecular level while others study neural circuitry using electrophysiology and high-resolution optics. A single topic can be studied using techniques from genetics, imaging, biochemistry, or electrophysiology. Therefore, it can be daunting for young scientists or anyone new to neuroscience to learn how to read the primary literature and develop their own experiments. This volume addresses that gap, gathering multidisciplinary knowledge and providing tools for understanding the neuroscience techniques that are essential to the field, and allowing the reader to design experiments in a variety of neuroscience disciplines. Written to provide a "hands-on" approach for graduate students, postdocs, or anyone new to the neurosciences Techniques within one field are compared, allowing readers to select the best techniques for their own work Includes key articles, books, and protocols for additional detailed study Data analysis boxes in each chapter help with data interpretation and offer guidelines on how best to represent results Walk-through boxes guide readers step-by-step through experiments

Decision Neuroscience-Jean-Claude Dreher 2016-09-27 Decision Neuroscience addresses fundamental questions about how the brain makes perceptual, value-based, and more complex decisions in non-social and social contexts. This book presents compelling neuroimaging, electrophysiological, lesional, and neurocomputational models in combination with hormonal and genetic approaches, which have led to a clearer understanding of the neural mechanisms behind how the brain makes decisions. The five parts of the book address distinct but inter-related topics and are designed to serve both as classroom introductions to major subareas in decision neuroscience and as advanced syntheses of all that has been accomplished in the last decade. Part I is devoted to anatomical, neurophysiological, pharmacological, and optogenetics animal studies on reinforcement-guided decision making, such as the representation of instructions, expectations, and outcomes; the updating of action values; and the evaluation process guiding choices between prospective rewards. Part II covers the topic of the neural representations of motivation, perceptual decision making, and value-based decision making in humans, combining neurcomputational models and brain imaging studies. Part III focuses on the rapidly developing field of social decision neuroscience, integrating recent mechanistic understanding of social decisions in both non-human primates and humans. Part IV covers clinical aspects involving disorders of decision making that link together basic research areas including systems, cognitive, and clinical neuroscience; this part examines dysfunctions of decision making in neurological and psychiatric disorders, such as Parkinson's disease, schizophrenia, behavioral addictions, and focal brain lesions. Part V focuses on the roles of various hormones (cortisol, oxytocin, ghrelin/leptine) and genes that underlie inter-individual differences observed with stress, food choices, and social decision-making processes. The volume is essential reading for anyone interested in decision making neuroscience. With contributions that are forward-looking assessments of the current and future issues faced by researchers, Decision Neuroscience is essential reading for anyone interested in decision-making neuroscience. Provides comprehensive coverage of approaches to studying individual and social decision neuroscience, including primate neurophysiology, brain imaging in healthy humans and in various disorders, and genetic and hormonal influences on decision making Covers multiple levels of analysis, from molecular mechanisms to neural-systems dynamics and computational models of how we make choices Discusses clinical implications of process dysfunctions, including schizophrenia, Parkinson's disease, eating disorders, drug addiction, and pathological gambling Features chapters from top international researchers in the field and full-color presentation throughout with numerous illustrations to highlight key concepts

Blinded by Science-Wastell, David 2017-03-15 This timely book critically examines the capabilities and limitations of new areas of biology, especially epigenetics and neuroscience, that are used as powerful arguments for developing social policy in a particular direction, exploring their implications for policy and practice.

Conn's Translational Neuroscience-P. Michael Conn 2016-09-28 Conn's Translational Neuroscience provides a comprehensive overview reflecting the depth and breadth of the field of translational neuroscience, with input from a distinguished panel of basic and clinical investigators. Progress has continued in understanding the brain at the molecular, anatomic, and physiological levels in the years following the 'Decade of the Brain,' with the results providing insight into the underlying basis of many neurological disease processes. This book alternates scientific and clinical chapters that explain the basic science underlying neurological processes and then relates that science to the understanding of neurological disorders and their treatment. Chapters cover disorders of the spinal cord, neuronal migration, the autonomic nervous system, the limbic system, ocular motility, and the basal ganglia, as well as demyelinating disorders, stroke, dementia and abnormalities of cognition, congenital chromosomal and genetic abnormalities, Parkinson's disease, nerve trauma, peripheral neuropathy, aphasias, sleep disorders, and myasthenia gravis. In addition to concise summaries of the most recent biochemical, physiological, anatomical, and behavioral advances, the chapters summarize current findings on neuronal gene expression and protein synthesis at the molecular level. Authoritative and comprehensive, Conn's Translational Neuroscience provides a fully up-to-date and readily accessible guide to brain functions at the cellular and molecular level, as well as a clear demonstration of their emerging diagnostic and therapeutic importance. Provides a fully up-to-date and readily accessible guide to brain functions at the cellular and molecular level, while also clearly demonstrating their emerging diagnostic and therapeutic importance Features contributions from leading global basic and clinical investigators in the field Provides a great resource for researchers and practitioners interested in the basic science underlying neurological processes Relates and translates the current science to the understanding of neurological disorders and their treatment

Fundamental Neuroscience-March D. Ard 2002 The 2nd Edition of Fundamental Neuroscience presents a contemporary and integrated approach to systems neurobiology (sensory, motor, visual, auditory, etc.), featuring a wealth of clinical examples. Full-color illustrations and high-quality clinical photographs of brain structure, with more than 80 new illustrations in this edition, emphasize clinical examples and enhance discussions throughout the text. Examples of MRI and CT show normal structures and selected clinical conditions. This Edition also includes a new chapter on The Neurological Examination and a new chapter on a Synopsis of Cranial Nerves of the Brainstem both chapters focusing on anatomico-clinical concepts and examples. Fundamental Neuroscience, 2nd Edition contains basic science and clinical information in an integrated format that serves as an excellent foundation for further study, equips students for the USMLE Step 1 exam, and prepares them to diagnose the neurologically compromised patient. Emphasis on human neuroanatomy and neuroscience Meets the neuroanatomical emphasis given in most neuroscience courses in medical schools. The first textbook to integrate vascular patterns with systems neurobiology. Highly readable and consistent writing style throughout the text. Includes many clinical correlations and examples which are invaluable to understanding the neurologically impaired patient. Increased clinical coverage New chapter on Cranial Nerves New chapter on Neurological Exam Spanish version also available, ISBN: 84-8174-656-8

Neuroscience of Alcohol-Victor R. Preedy 2019-03-19 Neuroscience of Alcohol: Mechanisms and Treatment presents the fundamental information necessary for a thorough understanding of the neurobiological underpinnings of alcohol addiction and its effects on the brain. Offering thorough coverage of all aspects of alcohol research, treatment and prevention, and containing contributions from internationally recognized experts, the book provides students, early-career researchers, and investigators at all levels with a fundamental introduction to all aspects of alcohol misuse. Alcohol is one of the world's most common addictive substances, with about two billion individuals worldwide consuming it in one form or another and three million annual deaths that are associated with alcohol misuse. Alcohol alters a variety of neurological processes, from molecular biology, to cognition. Moreover, addiction to alcohol can lead to numerous other health concerns and damage virtually every organ system in the body, making diagnosis and treatment of individuals addicted to alcohol of critical importance. Integrates cutting-edge research on the pharmacological, cellular and molecular aspects of alcohol use, along with its effects on neurobiological function Discusses alcohol use as a component of dual-use and poly addictions Outlines numerous screening and treatment strategies for alcohol misuse Covers both the physical and psychological effects of alcohol use and withdrawals to provide a fully-formed view of alcohol dependency and its effects

Principles of Neural Science-Eric R. Kandel 1991

Neuroscience-Mitchell Glickstein 2014-01-17 An introduction to the structure and function of the nervous system that emphasizes the history of experiments and observations that led to modern neuroscientific knowledge.

Handbook of Sport Neuroscience and Psychophysiology-Roland Carlstedt 2018-10-09 Out of the broad arena of sport science and sport psychology, Roland A. Carlstedt presents a comprehensive collection on the neuroscience and associated psychophysiology that underlies and drives sport performance. Featuring sections ranging from the basics and foundations (anatomy and physiology) to the applied (assessment during competition, training, and mental training), Handbook of Sport Neuroscience and Psychophysiology is the first volume to provide students, researchers, practitioners, and coaches the latest knowledge on the brain, mind-body processes, and psychophysiological responding in the context of sport performance.

Fundamental Neuroscience-Duane E. Haines 1997

Neuroscience Fundamentals for Communication Sciences and Disorders-Richard D. Andreatta 2018-12-14 Neuroscience Fundamentals for Communication Sciences and Disorders is a comprehensive textbook designed for undergraduate neural bases or graduate neuroscience courses in communication sciences and disorders programs (CSD). Written with a fresh user-friendly conversational style and complemented by more than 350 visually rich and beautifully drawn full-color illustrations, this book emphasizes brain and behavior relationships while also ensuring coverage of essential neuroanatomy in an integrative fashion. With a comprehensive background in neuroscience fundamentals, students will be able to better understand and apply brain-behavior relationships to make appropriate clinical assessments and treatment decisions. Neuroscience Fundamentals for Communication Sciences and Disorders is designed to provide CSD students with a broad overview of the principles, processes, and structures underlying the workings of the human nervous system. Extending well beyond traditional neuroanatomy-based textbooks, this publication is designed to satisfy three major goals: Provide neuroanatomical and neurophysiological detail that meets the real-world needs of the contemporary CSD student, as they move forward toward clinical practice, and into the future where advancements in the field of health and brain sciences are accelerating and contributing more and more to rehabilitation.Provide clear, understandable explanations and intuitive material that explains how and why neuroanatomical systems, processes, and mechanisms of the nervous system operate as they do during human behavior.Provide a depth and scope of material that will allow students to read, better understand, and appreciate a wide range of evidence-based literature related to behavior, cognition, emotion, language, and sensory perception--areas that directly impact treatment decisions. Key Features: An emphasis on fundamental information on neuroanatomy, neurophysiology, and functional processes using an analogy-driven and relaxed conversational writing style.More than 350 new and beautifully illustrated full-color neuroanatomical and neurophysiological figures that work to bring the written material to life.Content is divided into four major sections that build upon each other to foster a comprehensive understanding of the nervous system from the cellular to systems.Three summary chapters on the neural bases of speech, language, and hearing that help integrate the basic information from earlier chapters with content specific to CSD.Each chapter begins with an introduction and learning objectives and ends with a top ten summary list of key take-home concepts and study review questions.Bolded key terms throughout with a comprehensive glossary of definitions.Clinical Importance boxes highlight clinically relevant disorders and syndromes that compliment topic coverage.Further Interest boxes highlight interesting and exciting facts about the nervous system's structure, physiology, and functionality.Disclaimer: Please note that ancillary content (such as documents, audio, and video, etc.) may not be included as published in the original print version of this book.

Fundamental Neuroscience for Basic and Clinical Applications-Duane E. Haines 2017-10-13 Using a rigorous yet clinically-focused approach, Fundamental Neuroscience for Basic and Clinical Applications, 5th Edition, covers the fundamental neuroscience information needed for coursework, exams, and beyond. It integrates neuroanatomy, pharmacology, and physiology, and offers a full section devoted to systems neurobiology, helping you comprehend and retain the complex material you need to know. Highlights clinical content in blue throughout the text, helping you focus on what you need to know in the clinical environment. Presents thoroughly updated information in every chapter, with an emphasis on new clinical thinking as related to the brain and systems neurobiology. Features hundreds of correlated state-of-the-art imaging examples, anatomical diagrams, and histology photos - nearly half are new or improved for this edition. Pays special attention to the correct use of clinical and anatomical terminology, and provides new clinical text and clinical-anatomical correlations.

Cognitive Neuroscience of Memory-Scott D. Slotnick 2017-02-28 Within the last two decades, the field of cognitive neuroscience has begun to thrive, with technological advances that non-invasively measure human brain activity. This is the first book to provide a comprehensive and up-to-date treatment on the cognitive neuroscience of memory. Topics include cognitive neuroscience techniques and human brain mechanisms underlying long-term memory success, long-term memory failure, working memory, implicit memory, and memory and disease. Cognitive Neuroscience of Memory highlights both spatial and temporal aspects of the functioning human brain during memory. Each chapter is written in an accessible style and includes background information and many figures. In his analysis, Scott D. Slotnick questions popular views, rather than simply assuming they are correct. In this way, science is depicted as open to question, evolving, and exciting.

Towards a New Cognitive Neuroscience: Modeling Natural Brain Dynamics-Klaus Gramann 2014-10-03 Decades of brain imaging experiments have revealed important insights into the architecture of the human brain and the detailed anatomic basis for the neural dynamics supporting human cognition. However, technical restrictions of traditional brain imaging approaches including functional magnetic resonance tomography (fMRI), positron emission tomography (PET), and magnetoencephalography (MEG) severely limit participants' movements during experiments. As a consequence, our knowledge of the neural basis of human cognition is rooted in a dissociation of human cognition from what is arguably its foremost, and certainly its evolutionarily most determinant function, organizing our behavior so as to optimize its consequences in our complex, multi-scale, and ever-changing environment. The concept of natural cognition, therefore, should not be separated from our fundamental experience and role as embodied agents acting in a complex, partly unpredictable world. To gain new insights into the brain dynamics supporting natural cognition, we must overcome restrictions of traditional brain imaging technology. First, the sensors used must be lightweight and mobile to allow monitoring of brain activity during free participant movements. New hardware technology for electroencephalography (EEG) and near infrared spectroscopy (NIRS) allows recording electrical and hemodynamic brain activity while participants are freely moving. New data-driven analysis approaches must allow separation of signals arriving at the sensors from the brain and from non-brain sources (neck muscles, eyes, heart, the electrical environment, etc.). Independent component analysis (ICA) and related blind source separation methods allow separation of brain activity from non-brain activity from data recorded during experimental paradigms that stimulate natural cognition. Imaging the precisely timed, distributed brain dynamics that support all forms of our motivated actions and interactions in both laboratory and real-world settings requires new modes of data capture and of data processing. Synchronously recording participants' motor behavior, brain activity, and other physiology, as well as their physical environment and external events may be termed mobile brain/body imaging ('MoBI'). Joint multi-stream analysis of recorded MoBI data is a major conceptual, mathematical, and data processing challenge. This Research Topic is one result of the first international MoBI meeting in Delmenhorst Germany in September 2013. During an intense workshop researchers from all over the world presented their projects and discussed new technological developments and challenges of this new imaging approach. Several of the presentations are compiled in this Research Topic that we hope may inspire new research using the MoBI paradigm to investigate natural cognition by recording and analyzing the brain dynamics and behavior of participants performing a wide range of naturally motivated actions and interactions.

Closed Loop Neuroscience-Ahmed El Hady 2016-09-08 Closed Loop Neuroscience addresses the technical aspects of closed loop neurophysiology, presenting the implementation of these approaches spanning several domains of neuroscience, from cellular and network neurophysiology, through sensory and motor systems, and then clinical therapeutic devices. Although closed-loop approaches have long been a part of the neuroscientific toolbox, these techniques are only now gaining popularity in research and clinical applications. As there is not yet a comprehensive methods book addressing the topic as a whole, this volume fills that gap, presenting state-of-the-art approaches and the technical advancements that enable their application to different scientific problems in neuroscience. Presents the first volume to offer researchers a comprehensive overview of the technical realities of employing closed loop techniques in their work Offers application to in-vitro, in-vivo, and hybrid systems Contains an emphasis on the actual techniques used rather than on specific results obtained Includes exhaustive protocols and descriptions of software and hardware, making it easy for readers to implement the proposed methodologies Encompasses the clinical/neuroprosthetic aspect and how these systems can also be used to contribute to our understanding of basic neurophysiology Edited work with chapters authored by leaders in the field from around the globe – the broadest, most expert coverage available

Network Neuroscience-Flavio Fröhlich 2016-09-20 Studying brain networks has become a truly interdisciplinary endeavor, attracting students and seasoned researchers alike from a wide variety of academic backgrounds. What has been lacking is an introductory textbook that brings together the different fields and provides a gentle introduction to the major concepts and findings in the emerging field of network neuroscience. Network Neuroscience is a one-stop-shop that is of equal use to the neurobiologist, who is interested in understanding the quantitative methods employed in network neuroscience, and to the physicist or engineer, who is interested in neuroscience applications of mathematical and engineering tools. The book spans 27 chapters that cover everything from individual cells all the way to complex network disorders such as depression and autism spectrum disorders. An additional 12 toolboxes provide the necessary background for making network neuroscience accessible independent of the reader's background. Dr. Flavio Frohlich (www.networkneuroscientist.org) wrote this book based on his experience of mentoring dozens of trainees in the Frohlich Lab, from undergraduate students to senior researchers. The Frohlich lab (www.frohlichlab.org) pursues a unique and integrated vision that combines computer simulations, animal model studies, human studies, and clinical trials with the goal of developing novel brain stimulation treatments for psychiatric disorders. The book is based on a course he teaches at UNC that has attracted trainees from many different departments, including neuroscience, biomedical engineering, psychology, cell biology, physiology, neurology, and psychiatry. Dr. Frohlich has consistently received rave reviews for his teaching. With this book he hopes to make his integrated view of neuroscience available to trainees and researchers on a global scale. His goal is to make the book the training manual for the next generation of (network) neuroscientists, who will be fusing biology, engineering, and medicine to unravel the big questions about the brain and to revolutionize psychiatry and neurology. Easy-to-read, comprehensive introduction to the emerging field of network neuroscience Includes 27 chapters packed with information on topics from single neurons to complex network disorders such as depression and autism Features 12 toolboxes serve as primers to provide essential background knowledge in the fields of biology, mathematics, engineering, and physics

The Neuroscience of Addiction-Francesca Filbey 2019-03-14 Combines classic theories with current neuroscientific studies to explain the addiction cycle, focusing on neuroimaging studies and applications.

Neuroscience perspectives on Security: Technology, Detection, and Decision Making-Elena Rusconi 2015-08-03 In security science, efficient operation depends typically on the interaction between technology, human and machine detection and human and machine decision making. A perfect example of this interplay is 'gatekeeping', which is aimed to prevent the passage of people and objects that represent known threats from one end to the other end of an access point. Gatekeeping is most often achieved via visual inspections, mass screening, random sample probing and/or more targeted controls on attempted passages at points of entry. Points of entry may be physical (e.g. national borders) or virtual (e.g. connection log-ons). Who and what are defined as security threats and the resources available to gatekeepers determine the type of checks and technologies that are put in place to ensure appropriate access control. More often than not, the net performance of technology-aided screening and authentication systems ultimately depends on the characteristics of human operators. Assessing cognitive, affective, behavioural, perceptual and brain processes that may affect gatekeepers while undertaking this task is fundamental. On the other hand, assessing the same processes in those individuals who try to breach access to secure systems (e.g. hackers), and try to cheat controls (e.g. smugglers) is equally fundamental and challenging. From a security standpoint it is vital to be able to anticipate, focus on and correctly interpret the signals connected with such attempts to breach access and/or elude controls, in order to be proactive and to enact appropriate responses. Knowing cognitive, behavioral, social and neural constraints that may affect the security enterprise will undoubtedly result in a more effective deployment of existing human and technological resources. Studying how inter-observer variability, human factors and biology may affect the security agenda, and the usability of existing security technologies, is of great economic and policy interest. In addition, brain sciences may suggest the possibility of novel methods of surveillance and intelligence gathering. This is just one example of a typical security issue that may be fruitfully tackled from a neuroscientific and interdisciplinary perspective. The objective of our Research Topic was to document across relevant disciplines some of the most recent developments, ideas, methods and empirical findings that have the potential to expand our knowledge of the human factors involved in the security process. To this end we welcomed empirical contributions using different methodologies such as those applied in human cognitive neuroscience, biometrics and ethology. We also accepted original theoretical contributions, in the form of review articles, perspectives or opinion papers on this topic. The submissions brought together researchers from different backgrounds to discuss topics which have scientific, applicative and social relevance.

Neuroscience of Nicotine-Victor R. Preedy 2019-03-20 Neuroscience of Nicotine: Mechanisms and Treatment presents the fundamental information necessary for a thorough understanding of the neurobiological underpinnings of nicotine addiction and its effects on the brain. Offering thorough coverage of all aspects of nicotine research, treatment, policy and prevention, and containing contributions from internationally recognized experts, the book provides students, early-career researchers, and investigators at all levels with a fundamental introduction to all aspects of nicotine misuse. With an estimated one billion individuals worldwide classified as tobacco users—and tobacco use often being synonymous with nicotine addiction—nicotine is one of the world's most common addictive substances, and a frequent comorbidity of misuse of other common addictive substances. Nicotine alters a variety of neurological processes, from molecular biology, to cognition, and quitting is exceedingly difficult because of the number of withdrawal symptoms that accompany the process. Integrates cutting-edge research on the pharmacological, cellular and molecular aspects of nicotine use, along with its effects on neurobiological function Discusses nicotine use as a component of dual-use and poly addictions and outlines numerous screening and treatment strategies for misuse Covers both the physical and psychological effects of nicotine use and withdrawal to provide a fully-formed view of nicotine dependency and its effects

Autism and Joint Attention-Peter C. Mundy 2016-03-01 From a preeminent researcher, this book looks at the key role of joint attention in both typical and atypical development. Peter C. Mundy shows that no other symptom dimension is more strongly linked to early identification and treatment of autism spectrum disorder (ASD). He synthesizes a wealth of knowledge on how joint attention develops, its neurocognitive underpinnings, and how it helps to explain the learning, language, and social-cognitive features of ASD across the lifespan. Clinical implications are explored, including reviews of cutting-edge diagnostic methods and targeted treatment approaches.

The Disordered Mind-Eric R. Kandel 2018-08-28 A Nobel Prize–winning neuroscientist's probing investigation of what brain disorders can tell us about human nature Eric R. Kandel, the winner of the Nobel Prize in Physiology or Medicine for his foundational research into memory storage in the brain, is one of the pioneers of modern brain science. His work continues to shape our understanding of how learning and memory work and to break down age-old barriers between the sciences and the arts. In his seminal new book, The Disordered Mind, Kandel draws on a lifetime of pathbreaking research and the work of many other leading neuroscientists to take us on an unusual tour of the brain. He confronts one of the most difficult questions we face: How does our mind, our individual sense of self, emerge from the physical matter of the brain? The brain's 86 billion neurons communicate with one another through very precise connections. But sometimes those connections are disrupted. The brain processes that give rise to our mind can become disordered, resulting in diseases such as autism, depression, schizophrenia, Parkinson's, addiction, and post-traumatic stress disorder. While these disruptions bring great suffering, they can also reveal the mysteries of how the brain produces our most fundamental experiences and capabilities—the very nature of what it means to be human. Studies of autism illuminate the neurological foundations of our social instincts; research into depression offers important insights on emotions and the integrity of the self; and paradigm-shifting work on addiction has led to a new understanding of the relationship between pleasure and willpower. By studying disruptions to typical brain functioning and exploring their potential treatments, we will deepen our understanding of thought, feeling, behavior, memory, and creativity. Only then can we grapple with the big question of how billions of neurons generate consciousness itself.

Sex, Lies, & Brain Scans-B. J. Sahakian 2017 This book considers what the technique of fMRI entails, and what information it can give us, showing which applications are possible today, and which ones are science fiction. It also looks at the important ethical questions these techniques raise.

The Student's Guide to Cognitive Neuroscience-Jamie Ward 2015-02-11 Reflecting recent changes in the way cognition and the brain are studied, this thoroughly updated third edition of the best-selling textbook provides a comprehensive and student-friendly guide to cognitive neuroscience. Jamie Ward provides an easy-to-follow introduction to neural structure and function, as well as all the key methods and procedures of cognitive neuroscience, with a view to helping students understand how they can be used to shed light on the neural basis of cognition. The book presents an up-to-date overview of the latest theories and findings in all the key topics in cognitive neuroscience, including vision, memory, speech and language, hearing, numeracy, executive function, social and emotional behaviour and developmental neuroscience, as well as a new chapter on attention. Throughout, case studies, newspaper reports and everyday examples are used to help students understand the more challenging ideas that underpin the subject. In addition each chapter includes: Summaries of key terms and points Example essay questions Recommended further reading Feature boxes exploring interesting and popular questions and their implications for the subject. Written in an engaging style by a leading researcher in the field, and presented in full-color including numerous illustrative materials, this book will be invaluable as a core text for undergraduate modules in cognitive neuroscience. It can also be used as a key text on courses in cognition, cognitive neuropsychology, biopsychology or brain and behavior. Those embarking on research will find it an invaluable starting point and reference. The Student's Guide to Cognitive Neuroscience, 3rd Edition is supported by a companion website, featuring helpful resources for both students and instructors.

The Neuroscience of Intelligence-

Psychoanalytical neuroscience: Exploring psychoanalytic concepts with neuroscientific methods-Nikolai Axmacher 2015-01-09

Neuroscience of Preference and Choice-Raymond Dolan 2012 One of the most pressing questions in neuroscience, psychology and economics today is how does the brain generate preferences and make choices? With a unique interdisciplinary approach, this volume is among the first to explore the cognitive and neural mechanisms mediating the generation of the preferences that guide choice. From preferences determining mundane purchases, to social preferences influencing mating choice, through to moral decisions, the authors adopt diverse approaches to answer the question. Chapters explore the instability of preferences and the common neural processes that occur across preferences. Edited by one of the world's most renowned cognitive neuroscientists, each chapter is authored by an expert in the field, with a host of international contributors. Emphasis on common process underlying preference generation makes material applicable to a variety of disciplines - neuroscience, psychology, economics, law, philosophy, etc. Offers specific focus on how preferences are generated to guide decision making, carefully examining one aspect of the broad field of neuroeconomics and complementing existing volumes Features outstanding, international scholarship, with chapters written by an expert in the topic area

The Neuroscience of Handwriting-Michael P. Caligiuri 2012-02-22 The Daubert trilogy of U.S. Supreme Court cases has established that scientific expert testimony must be based on science grounded in empirical research. As such, greater scrutiny is being placed on questioned document examination generally, and handwriting comparison in particular. Bridging the gap between theory and practice, The Neuroscience of Handwriting: Applications in Forensic Document Examination examines the essential neuroscientific principles underlying normal and pathological hand motor control and handwriting. Topics discussed include: Fundamental principles in the neuroanatomy and neurochemistry of hand motor control and their application to research in handwriting The epidemiology, pathophysiology, and motor characteristics of neurogenerative diseases such as Parkinson's, Huntington's, Alzheimer's, multiple sclerosis, essential tremor, and motor neuron disease and their effects on handwriting Psychotropic medications prescribed for depression, bipolar disorder, and psychosis; their mechanisms of action; and their effect on motor behavior and handwriting The impact of substance abuse on handwriting An overview of the aging process and its effects on motor control and handwriting The kinematic approach and new findings on the kinematic analyses of genuine, disguised, and forged signatures The authors' laboratory research on authentic and forged signatures An essential resource for professionals and researchers in the forensic documentation examination and legal communities, this volume provides a window on the scientific process of signature and handwriting authentication, integrating the extensive research on neural processes and exploring how disease, medication, and advanced age alter these processes.

Sensor Technology in Neuroscience-Michael Thompson 2013 Biosensor technology has rapidly expanded into a wide variety of applications in the last few years. Such fields include clinical diagnostics, environmental chemistry, drug discovery and pathogen detection, to name but a few. The structure of these sensors is based on the intimate combination of a biological entity with a transducer capable of generating an electrical signal to provide information on the biological system being studied. Until now there has been a limited treatment of the study of whole cells (as a biological component) due to the difficulty in connecting transducers to cell populations. This book focuses

on several aspects of neural behaviour both in vitro and in vivo, and for the first time, the detection of populations of neurons (rather than single cells) will be presented. The fundamental behaviour and characterization of neurons on various substrates, using a variety of electronic devices such as transistors and microelectrode arrays will be discussed. Future perspectives discussed in the book include artificial intelligence using biological neural networks and nanoneuromedicine. The authors have considerable experience in biosensor technology, and have pioneered the study of neural populations using biosensors in collaboration with neurophysiologists and neuroendrocrinologists. This book will be invaluable to university neuroscience and analytical chemistry departments and students, academics and physicians will benefit from its accessible style and format.

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