Active Learning In Advanced Analytical Chemistry A Course


This book includes the proceedings of the Intelligent and Fuzzy Techniques INFUS 2019 Conference, held in Istanbul, Turkey, on July 23–25, 2019. Big data analytics refers to the strategy of analyzing large volumes of data, or big data, gathered from a wide variety of sources, including social networks, videos, digital images, sensors, and sales transaction records. Big data analytics allows data scientists and various other users to evaluate large volumes of transaction data and other data sources that traditional business systems would be unable to tackle. Data-driven and knowledge-driven approaches and techniques have been widely used in intelligent decision-making, and they are increasingly attracting attention due to their importance and effectiveness in addressing uncertainty and incompleteness. INFUS 2019 focused on intelligent and fuzzy systems with applications in big data analytics and decision-making, providing an international forum that brought together those actively involved in areas of interest to data science and knowledge engineering.

These proceeding feature about 150 peer-reviewed papers from countries such as China, Iran, Turkey, Malaysia, India, USA, Spain, France, Poland, Mexico, Bulgaria, Algeria, Pakistan, Australia, Lebanon, and Czech Republic. The rapid growth of the world population has resulted in an exponential expansion of both urban and agricultural areas. Identifying and managing such earthly changes in an automatic way poses a worth-addressing challenge, in which remote sensing technology can have a fundamental role to answer—at least partially—such demands. The recent advent of cutting-edge processing facilities has fostered the adoption of deep learning architectures owing to their generalization capabilities. In this respect, it seems evident that the pace of deep learning in the remote sensing domain remains somewhat lagging behind that of its computer vision counterpart. This is due to the scarce availability of ground truth information in comparison with other computer vision domains. In this book, we aim at advancing the state of the art in linking deep learning methodologies with remote sensing image processing by collecting 20 contributions from different worldwide scientists and laboratories. The book presents a wide range of methodological advancements in the deep learning field that come with different applications in the remote sensing landscape such as wildfire and postdisaster damage detection, urban forest mapping, vine disease, and pavement marking detection, desert road mapping, road and building outline extraction, vehicle and vessel detection, water identification, and text-to-image matching. In education today, technology alone doesn't always lead to immediate success for students or institutions. In order to gauge the efficacy of educational technology, we need ways to measure the efficacy of educational practices in their own right. Through a better understanding of how learning takes place, we may work toward establishing best practices for students, educators, and institutions. These goals can be accomplished with learning analytics. Learning Analytics: From Research to Practice updates this emerging field with the latest in theories, findings,
strategies, and tools from across education and technological disciplines. Guiding readers through
preparation, design, and examples of implementation, this pioneering reference clarifies LA methods as not
mere data collection but sophisticated, systems-based analysis with practical applicability inside the
classroom and in the larger world. Case studies illustrate applications of LA throughout academic settings
(e.g., intervention, advisement, technology design), and their resulting impact on pedagogy and learning. The
goal is to bring greater efficiency and deeper engagement to individual students, learning communities, and
educators, as chapters show diverse uses of learning analytics to: Enhance student and faculty performance.
Improve student understanding of course material. Assess and attend to the needs of struggling learners.
Improve accuracy in grading. Allow instructors to assess and develop their own strengths. Encourage more
efficient use of resources at the institutional level. Researchers and practitioners in educational technology,
IT, and the learning sciences will hail the information in Learning Analytics: From Research to Practice as a
springboard to new levels of student, instructor, and institutional success. The last decade has seen a
dramatic increase in the application of active learning methods including problem-based learning,
cooperative learning, and service learning and supportive strategies such as electronic methods to the
college/university chemistry classroom and laboratory. This symposium series book focuses on the
application of active learning methods in teaching analytical science, broadly defined, at both the
undergraduate and graduate levels. The volume includes a wide range of examples of how these methods are
being applied at public and private community colleges, four-year colleges, and graduate research
universities in the United States and abroad. As such the strategies and materials described in the book
should be of interest to analytical chemists, chemical educators, and chemistry teaching faculty and graduate
students no matter their area of specialization. This book constitutes the refereed proceedings of the 8th
International Conference on Advanced Data Mining and Applications, ADMA 2012, held in Nanjing, China, in
December 2012. The 32 regular papers and 32 short papers presented in this volume were carefully
reviewed and selected from 168 submissions. They are organized in topical sections named: social media
mining; clustering; machine learning; algorithms and applications; classification; prediction, regression and
recognition; optimization and approximation; mining time series and streaming data; Web mining and
semantic analysis; data mining applications; search and retrieval; information recommendation and hiding;
outlier detection; topic modeling; and data cube computing. This monograph examines the nature of active
learning at the higher education level, the empirical research on its use, the common obstacles and barriers
that give rise to faculty resistance, and how faculty and staff can implement active learning techniques. A
preliminary section defines active learning and looks at the current climate surrounding the concept. A
second section, entitled "The Modified Lecture" offers ways that teachers can incorporate active learning into
their most frequently used format: the lecture. The following section on classroom discussion explains the
conditions and techniques needed for the most useful type of exchange. Other ways to promote active
learning are also described including: visual learning, writing in class, problem solving, computer-based
instruction, cooperative learning, debates, drama, role playing, simulations, games, and peer teaching. A
section on obstacles to implementing active learning techniques leads naturally to the final section,
"Conclusions and Recommendations," which outlines the roles that each group within the university can play
in order to encourage the implementation of active learning strategies. The text includes over 200 references
and an index. (JB) This book presents original research works by researchers, engineers and practitioners in
the field of artificial intelligence and cognitive computing. The book is divided into two parts, the first of which
focuses on artificial intelligence (AI), knowledge representation, planning, learning, scheduling, perception-
reactive AI systems, evolutionary computing and other topics related to intelligent systems and
computational intelligence. In turn, the second part focuses on cognitive computing, cognitive science and
cognitive informatics. It also discusses applications of cognitive computing in medical informatics, structural
health monitoring, computational intelligence, intelligent control systems, bio-informatics, smart
manufacturing, smart grids, image/video processing, video analytics, medical image and signal processing,
and knowledge engineering, as well as related applications. Employ cognitive theory in the classroom every
day Research into how we learn has opened the door for utilizing cognitive theory to facilitate better student
learning. But that's easier said than done. Many books about cognitive theory introduce radical but
impractical theories, failing to make the connection to the classroom. In Small Teaching, James Lang
presents a strategy for improving student learning with a series of modest but powerful changes that make a
big difference—many of which can be put into practice in a single class period. These strategies are
designed to bridge the chasm between primary research and the classroom environment in a way that can
be implemented by any faculty in any discipline, and even integrated into pre-existing teaching techniques.
Learn, for example: How does one become good at retrieving knowledge from memory? How does making
predictions now help us learn in the future? How do instructors instill fixed or growth mindsets in their
students? Each chapter introduces a basic concept in cognitive theory, explains when and how it should be
employed, and provides firm examples of how the intervention has been or could be used in a variety of disciplines. Small teaching techniques include brief classroom or online learning activities, one-time interventions, and small modifications in course design or communication with students. This book represents the emerging efforts of a growing international network of researchers and practitioners to promote the development and uptake of evidence-based pedagogies in higher education, at something a level approaching large-scale impact. By offering a communication venue that attracts and enhances much needed partnerships among practitioners and researchers in pedagogical innovation, we aim to change the conversation and focus on how we work and learn together – i.e. extending the implementation and knowledge of co-design methods. In this first edition of our Research Topic on Active Learning, we highlight two (of the three) types of publications we wish to promote. First are studies aimed at understanding the pedagogical designs developed by practitioners in their own practices by bringing to bear the theoretical lenses developed and tested in the education research community. These types of studies constitute the “practice pull” that we see as a necessary counterbalance to “knowledge push” in a more productive pedagogical innovation ecosystem based on research-practitioner partnerships. Second are studies empirically examining the implementations of evidence-based designs in naturalistic settings and under naturalistic conditions. Interestingly, the teams conducting these studies are already exemplars of partnerships between researchers and practitioners who are uniquely positioned as “in-betweens” straddling the two worlds. As a result, these publications represent both the rigours of research and the pragmatism of reflective practice. In forthcoming editions, we will add to this collection a third type of publication -- design profiles. These will present practitioner-developed pedagogical designs at varying levels of abstraction to be held to scrutiny amongst practitioners, instructional designers and researchers alike. We hope by bringing these types of studies together in an open access format that we may contribute to the development of new forms of practitioner-researcher interactions that promote co-design in pedagogical innovation. Focusing on fundamental principles, Hydro-Environmental Analysis: Freshwater Environments presents in-depth information about freshwater environments and how they are influenced by regulation. It provides a holistic approach, exploring the factors that impact water quality and quantity, and the regulations, policy and management methods that are necessary to maintain this vital resource. It offers a historical viewpoint as well as an overview and foundation of the physical, chemical, and biological characteristics affecting the management of freshwater environments. The book concentrates on broad and general concepts, providing an interdisciplinary foundation. The author covers the methods of measurement and classification; chemical, physical, and biological characteristics; indicators of ecological health; and management and restoration. He also considers common indicators of environmental health; characteristics and operations of regulatory control structures; applicable laws and regulations; and restoration methods. The text delves into rivers and streams in the first half and lakes and reservoirs in the second half. Each section centers on the characteristics of those systems and methods of classification, and then moves on to discuss the physical, chemical, and biological characteristics of each. In the section on lakes and reservoirs, it examines the characteristics and operations of regulatory structures, and presents the methods commonly used to assess the environmental health or integrity of these water bodies. It also introduces considerations for restoration, and presents two unique aquatic environments: wetlands and reservoir tailwaters. Written from an engineering perspective, the book is an ideal introduction to the aquatic and limnological sciences for students of environmental science, as well as students of environmental engineering. It also serves as a reference for engineers and scientists involved in the management, regulation, or restoration of freshwater environments. Active learning is now a form of learning that accompanies the knowledge evolution that challenges the learner to promote it, but also encourages him to investigate and become emotionally involved in the task. The great key to obtaining this behavior successfully depends, therefore, on the subject's involvement and ability to undertake, so that active learning becomes emotional entrepreneurial learning that generates new ideas and new forms of knowledge. From memorization, we move on to inquiry, from questioning to constructive participation, from hypostasis to problem-solving, from generalization to critical thinking. When we look at this book, we see real examples, concrete, and senses, from the most important act of human nature: learning! Computers and machines were developed to reduce time consumption and manual human efforts to complete projects efficiently. With fast-growing technologies in the field, we have finally reached a stage where almost everyone in the world has access to these high technologies. However, this is just a starting phase because future development is taking a more advanced route in the shape of artificial intelligence (AI). Although AI is under the computer science umbrella, nowadays there is no field unaffected by this high technology. The overall aim of using intelligence learning methods is to train machines to think intelligently and make decisions in different situations the same as humans. Previously, machines were doing what they were programmed to do, but now with AI, devices can think and behave like a human being. This book aims to present the application of advanced analytics and AI in different industries as
practical tools to develop prediction, optimization, and make decision models. Describing the latest developments in GIS applications at the Centre for Advanced Spatial Analysis (CASA) at the University College, London, this book demonstrates how CASA is advancing spatial decision systems and spatial analysis, which are essential to solving problems and better understanding how people live. How these systems and analyses are drawn from archaeology, architecture, cartography, computer science, environmental science, geography, planning, remote sensing, geomatic engineering, and transport studies is explained. Highlighted are projects such as Digital Egypt, which describes virtual reality reconstructions for Egyptian archaeological finds, and Virtual cities, which explores the concepts and nature of virtual cities, from early CAD models to the newly emerging data-rich cities that merge GIS with three-dimensional visualization. Over the last two decades, researchers are looking at imbalanced data learning as a prominent research area. Many critical real-world application areas like finance, health, network, news, online advertisement, social network media, and weather have imbalanced data, which emphasizes the research necessity for real-time implications of precise fraud/defaulter detection, rare disease/reaction prediction, network intrusion detection, fake news detection, fraud advertisement detection, cyber bullying identification, disaster events prediction, and more. Machine learning algorithms are based on the heuristic of equally-distributed balanced data and provide the biased result towards the majority data class, which is not acceptable considering imbalanced data is omnipresent in real-life scenarios and is forcing us to learn from imbalanced data for foolproof application design. Imbalanced data is multifaceted and demands a new perception using the novelty at sampling approach of data preprocessing, an active learning approach, and a cost perceptive approach to resolve data imbalance. Data Preprocessing, Active Learning, and Cost Perceptive Approaches for Resolving Data Imbalance offers new aspects for imbalanced data learning by providing the advancements of the traditional methods, with respect to big data, through case studies and research from experts in academia, engineering, and industry. The chapters provide theoretical frameworks and the latest empirical research findings that help to improve the understanding of the impact of imbalanced data and its resolving techniques based on data preprocessing, active learning, and cost perceptive approaches. This book is ideal for data scientists, data analysts, engineers, practitioners, researchers, academicians, and students looking for more information on imbalanced data characteristics and solutions using varied approaches. While a typical project manager's responsibility and accountability are both limited to a project with a clear start and end date, IT managers are responsible for an ongoing, ever-changing process for which they must adapt and evolve to stay updated, dependable, and secure in their field. Professional Advancements and Management Trends in the IT Sector offers the latest managerial trends within the field of information technology management. By collecting research from experts from around the world, in a variety of sectors and levels of technical expertise, this volume offers a broad variety of case studies, best practices, methodologies, and research within the field of information technology management. It will serve as a vital resource for practitioners and academicians alike. The notion of a flipped classroom draws on such concepts as active learning, student engagement, hybrid course design, and course podcasting. The value of a flipped class is in the repurposing of class time into a workshop where students can inquire about lecture content, test their skills in applying knowledge, and interact with one another in hands-on activities. The Handbook of Research on Active Learning and the Flipped Classroom Model in the Digital Age highlights current research on the latest trends in education with an emphasis on the technologies being used to meet learning objectives. Focusing on teaching strategies, learner engagement, student interaction, and digital tools for learning, this handbook of research is an essential resource for current and future educators, instructional designers, IT specialists, school administrators, and researchers in the field of education. The science of networks represented a substantial change in the way we see natural and technological phenomena. Now we have a better understanding that networks are, in most cases, networks of networks or multi-layered networks. This book provides a summary of the research done during one of the largest and most multidisciplinary projects in network science and complex systems (Multiplex). The science of complex networks originated from the empirical evidence that most of the structures of systems such as the internet, sets of protein interactions, and collaboration between people, share (at least qualitatively) common structural properties. This book examines how properties of networks that interact with other networks can change dramatically. The authors show that, dependent on the properties of links that interconnect two or more networks, we may derive different conclusions about the function and the possible vulnerabilities of the overall system of networks. This book presents a series of novel theoretical results together with their applications, providing a comprehensive overview of the field. As time goes on, big companies such as Amazon, Microsoft, Google and Apple become increasingly interested in virtual assistants. The interest and development of social robots has put research into affective and social computing at the forefront of the scene. The aim of Opinion Analysis in Interactions is to present methods based on artificial intelligence through a combination of machine learning models and symbolic approaches. Also discussed are natural
language processing and affective computing, via the analysis and generation of socio-emotional signals. The book explores the analysis of opinions in human–human interaction and tackles the less-explored (yet crucial) challenges related to the analysis methods of user opinions within the context of human–agent interaction. It also illustrates the implementation of strategies for selecting and generating agent utterances in response to user opinions, and opens up perspectives on the agent’s multimodal generation of utterances that hold attitudes.

Keys to engaging secondary students Research shows that all students—regardless of learning style, disability category, or language difference—learn more effectively when they are engaged in active learning. This book shows teachers how to help all students achieve positive learning outcomes. The authors provide a compilation of strategies that serve as blueprints for instructional design and directions for using them across a variety of content areas. The many benefits of active learning include: A more engaged and interactive classroom Increased self-directed learning Development of higher-order thinking skills such as analysis, synthesis, evaluation Improved reading, discussion, and writing competencies

The European Union has committed itself to the goal of extending the healthy lifespan of its citizens by two years under the 2020 strategy. This book brings together a diverse range of overviews, reflections and empirical research in the area which arise from the contribution of professionals and researchers from different fields of knowledge. Together they undertake to suggest possible pathways and to inspire action in all those who see themselves as participants in the processes and endeavour of building a society which espouses active, dignified, healthy and mindful aging. The background perspective which informs this project – that which is commonly referred to as Lifelong Education – calls for an integrated approach from diverse areas of knowledge in the service of building a more enlightened society: less susceptible to the influence of prejudices, enriched with human beings driven by ideals of health, justice, solidarity and nobility of spirit. Life must be understood as a totality that takes meaning from all its phases and which stimulates the vast potential that human beings, including older people and society at large, with its various systems, have for the common good. Let us face the challenge of building a new humanism, placing human beings and the sustainability of all forms of life at the centre of the dynamic process of change! Proceedings of the 1990 Biomedical Simulations Resource Workshop, held in Marina del Rey, California, May 18-19, 1990

The Citizenship curriculum aims to help young people to participate more fully in society through the development of a range of relevant skills and knowledge. This book shows how a variety of teaching strategies can be used to teach citizenship skills across a range of curriculum subjects as well as in Citizenship lessons themselves. Topics covered include: developing discussion thinking through debate addressing controversial issues investigating citizenship learning through role play working in groups learning with simulations participation. A lively and practical book which will be invaluable to student teachers and their trainers, Citizenship co-ordinators in schools and advisors across the country. It combines issues of pedagogy with real classroom experiences and demonstrates just how students learn from different teaching strategies. This volume presents papers on the topics covered at the National Academy of Engineering’s 2017 US Frontiers of Engineering Symposium. Every year the symposium brings together 100 outstanding young leaders in engineering to share their cutting-edge research and innovations in selected areas. The 2017 symposium was held September 25-27 at the United Technologies Research Center in East Hartford, Connecticut. The intent of this book is to convey the excitement of this unique meeting and to highlight innovative developments in engineering research and technical work. Although the field of child and adolescent development seems to be an easy one in which to provide active learning opportunities to students, few textbooks currently exist that actually do this. Child Development: An Active Learning Approach includes the following key features: - Challenging Misconceptions: true/false or multiple choice tests are incorporated at the beginning of each chapter to specifically address topics that are sources of misunderstanding amongst students. - Activities with children and adolescents: ‘hands-on’ activities that complement the ideas of the text, as an integral part of the text, rather than as “add-ons” at the end of each chapter. - ‘The journey of research’ will introduce students to the process of research that leads from early findings to more refined outcomes through real-life examples - ‘Test Yourself’ sections include activities that cause students to reflect on an issue through their own experiences to bring about increased motivation and understanding of a specific topic. - The Instructor’s Resource CD-ROM includes a computerized test bank, PowerPoint Slides, sample syllabi, suggested in-class learning activities, and homework assignments. - The Student Study Site includes interactive videos, self-quizzes, key term flashcards, SAGE journal articles with accompanying exercises, and web links with accompanying exercises. Interactive mobile technologies have now become the core of many—if not all—fields of society. Not only do the younger generation of students expect a mobile working and learning environment, but also the new ideas, technologies and solutions introduced on a nearly daily basis also boost this trend. Discussing and assessing key trends in the mobile field were the primary aims of the 11th International Conference on Interactive Mobile Communication, Technologies and Learning (IMCL2017), which was held in Thessaloniki from 30 November to 01 December 2017. Since being founded
in 2006, the conference has been devoted to new approaches in interactive mobile technologies, with a focus on learning. The IMCL conferences have in the meanwhile become a central forum of the exchange of new research results and relevant trends, as well as best practices. This book contains papers in the fields of: Future Trends and Emerging Mobile Technologies Design and Development of Mobile Learning Apps and Content Mobile Games—Gamification and Mobile Learning Adaptive Mobile Environments Augmented Reality and Immersive Applications Tangible, Embedded and Embodied Interaction Interactive Collaborative and Blended Learning Digital Technology in Sports Mobile Health Care and Training Multimedia Learning in Music Education 5G Network Infrastructure Case Studies Real-World Experiences The content will appeal to a broad readership, including policymakers, academics, educators, researchers in pedagogy and learning theory, school teachers, the learning industry, further education lecturers, etc. With the global academic community currently focused on student learning outcomes achievement, assessment, and continuous improvement, e-learning strategies provide effective measures than can assist educators and educational administrators in the satisfaction of key objectives. Whether it is creating and incorporating simulations, building courses and curriculum, engaging in virtual team building, managing online programs, concept mapping, developing an electronic portfolio program, creating active training environments, determining the instructors role, problem solving, evaluating online learning, or using e-learning to build an effective assessment program this book will prove to be an indispensable resource. Geared towards administrators, key decision makers, educators experienced with e-learning, and instructional technology students, it marries the leading literature and prevailing ideologies with best practices illustrated by notable real-world examples. Interfaces within computers, computing, and programming are consistently evolving and continue to be relevant to computer science as it progresses. Advancements in human-computer interactions, their aesthetic appeal, ease of use, and learnability are made possible due to the creation of user interfaces and result in further growth in science, aesthetics, and practical applications. Interface Support for Creativity, Productivity, and Expression in Computer Graphics is a collection of innovative research on usability, the apps humans use, and their sensory environment. While highlighting topics such as image datasets, augmented reality, and visual storytelling, this book is ideally designed for researchers, academicians, graphic designers, programmers, software developers, educators, multimedia specialists, and students seeking current research on unifying digital content with the physicality of the device through applications, thus addressing sensory perception. This book constitutes the refereed proceedings of the First ECML PKDD Workshop, AALTD 2015, held in Porto, Portugal, in September 2016. The 11 full papers presented were carefully reviewed and selected from 22 submissions. The first part focuses on learning new representations and embeddings for time series classification, clustering or for dimensionality reduction. The second part presents approaches on classification and clustering with challenging applications on medicine or earth observation data. These works show different ways to consider temporal dependency in clustering or classification processes. The last part of the book is dedicated to metric learning and time series comparison, it addresses the problem of speeding-up the dynamic time warping or dealing with multi-modal and multi-scale metric learning for time series classification and clustering. Active learning methods can provide significant advantages over traditional instructional practices, including improving student engagement and increasing student learning. Active Learning in General Chemistry: Specific Interventions focuses on evidence-based active learning methods that offer larger gains in engagement with as well as a more thorough education in general chemistry. This work serves as a selection of techniques that can inspire chemistry instructors and a comprehensive survey of effective active learning approaches in general chemistry. Chemistry faculty and administrations will find inspiration for improved teaching within this volume. The purpose of this handbook is to help launch institutional transformations in mathematics departments to improve student success. We report findings from the Student Engagement in Mathematics through an Institutional Network for Active Learning (SEMINAL) study. SEMINAL’s purpose is to help change agents, those looking to (or currently attempting to) enact change within mathematics departments and beyond—trying to reform the instruction of their lower division mathematics courses in order to promote high achievement for all students. SEMINAL specifically studies the change mechanisms that allow postsecondary institutions to incorporate and sustain active learning in Precalculus to Calculus 2 learning environments. Out of the approximately 2.5 million students enrolled in collegiate mathematics courses each year, over 90% are enrolled in Precalculus to Calculus 2 courses. Forty-four percent of mathematics departments think active learning mathematics strategies are important for Precalculus to Calculus 2 courses, but only 15 percent state that they are very successful at implementing them. Therefore, insights into the following research question will help with institutional transformations: What conditions, strategies, interventions and actions at the departmental and classroom levels contribute to the initiation, implementation, and institutional sustainability of active learning in the undergraduate calculus sequence (Precalculus to Calculus 2) across varied institutions? Comprehensive Coverage of the Entire Area of
Classification Research on the problem of classification tends to be fragmented across such areas as pattern recognition, database, data mining, and machine learning. Addressing the work of these different communities in a unified way, Data Classification: Algorithms and Applications explores the underlying algorithms of classification as well as applications of classification in a variety of problem domains, including text, multimedia, social network, and biological data. This comprehensive book focuses on three primary aspects of data classification: Methods: The book first describes common techniques used for classification, including probabilistic methods, decision trees, rule-based methods, instance-based methods, support vector machine methods, and neural networks. Domains: The book then examines specific methods used for data domains such as multimedia, text, time-series, network, discrete sequence, and uncertain data. It also covers large data sets and data streams due to the recent importance of the big data paradigm. Variations: The book concludes with insight on variations of the classification process. It discusses ensembles, rare-class learning, distance function learning, active learning, visual learning, transfer learning, and semi-supervised learning as well as evaluation aspects of classifiers. This book constitutes the refereed proceedings of the 15th International Conference on Image Analysis and Processing, ICIAP 2009, held in Vietri sul Mare, Italy, in September 2009. The 107 revised full papers presented together with 3 invited papers were carefully reviewed and selected from 168 submissions. The papers are organized in topical sections on computer graphics and image processing, low and middle level processing, 2D and 3D segmentation, feature extraction and image analysis, object detection and recognition, video analysis and processing, pattern analysis and classification, learning, graphs and trees, applications, shape analysis, face analysis, medical imaging, and image analysis and pattern recognition. Activists and educators explore ways to strengthen the ties between the classroom and the world.

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