

DIGITAL UNIVERSITY KERALA

Kerala University of Digital Sciences, Innovation and Technology

NEWSLETTER



PM Modi laid foundation stone of India's first Digital Science Park in Kerala

Table of contents



01

PM Modi laid foundation stone of India's first Digital Science Park in Kerala

03

DUK to collaborate with TKM and Thrissur GEC for research in electronics engineering

04

In conversation with Prof. Asharaf S, Dean (Development), Digital University Kerala

XploitMAP: Mapping Attackers Reachability to Secure Your Network | Digital University Kerala



05

Breast Cancer Screening Camp, Melthonnakkal Village, Mangalapuram Panchayat

06

Portable IoT enabled pH meter
Device for Intraoperative Auto-transfusion



07

Resume Building workshop for the 2023 batch

08

PGCSBM Batch 2 Physical Networking session

One-day experiential learning program conducted by Digital University Kerala

09

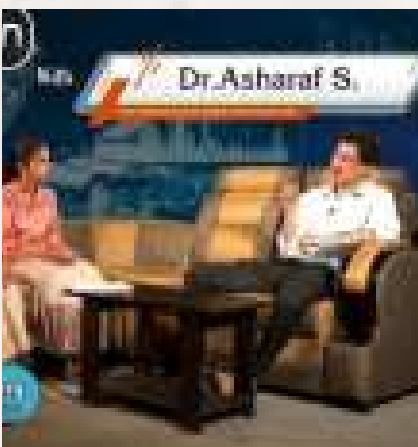
Publications

10

Knowledge Centre News

11

Book Review of the Month



PM Modi laid foundation stone of India's first Digital Science Park in Kerala



India's first third-generation Digital Science Park, for which foundation stone was laid by Prime Minister Narendra Modi on Tuesday, is aimed at transforming Kerala into a knowledge economy and higher learning hub. Coming up at a 13.93 acre site as part of the Technopark Phase IV-Technocity and located close to the Kerala University of Digital Sciences Innovation and Technology, (Digital University of Kerala-DUK), the project has been conceived as a multidisciplinary cluster-based interactive – innovation zone focused on digital technologies.

Initially, the park will facilitate industry and business units as well as technology startups from the domains of Artificial Intelligence (AI), robotics, electronics, smart hardware, sustainable and smart materials.

The park will initially have two buildings with a total area of two lakh square feet. The first, covering a space of 1.5 lakh square feet, will have five floors, housing Centres of Excellence including research labs and digital incubators, while the second building will house administrative as well as a digital experience centre.

The park will start its operations from the 10,000 sq. ft. space in Kabani located at Technopark Phase-IV within the next couple of months.

Unveiling the Rs 1,500 crore project coming up at Technopark Phase IV-Technocity, Modi said developing both physical connectivity and digital connectivity are essential to ensure the progress of the entire nation based on the goal of 'Ek Bharat, Sresht Bharat' (One India, Great India).

The Park will become operational with the launch of its first centre on electronics system design focusing on analog and mixed signal systems, VLSI (very-large-scale integration), AI processors and allied areas. U.K.-based semiconductor and software design company ARM has signed an agreement with Digital University Kerala on the academic, research and start-up-related activities as part of this centre. Covering an area of 10 lakh sq. ft. in two blocks, the Park will facilitate industry and business units as well as technology start-ups from the domains of Artificial Intelligence (AI), robotics, electronics, smart hardware, sustainable and smart materials in the initial phase.



A blueprint of the Digital Science Park in Thiruvananthapuram

DUK to collaborate with TKM and Thrissur GEC for research in electronics engineering



The MoU was exchanged during the G20-Digital Innovation Alliance (DIA) national roadshow held at the Maker Village in Kochi

Digital University Kerala (DUK) has signed memorandums of understanding (MoU) with Government Engineering College Thrissur (GECT) and TKM College of Engineering, Kollam, for collaborating on research-oriented programmes in electronics engineering.

According to a press note, the institutions will collaborate in areas such as Very-Large-Scale-Integration (VLSI), signal processing and embedded systems. The agreement will also enable students and staff working in the areas of electronics engineering to collaborate on developing chips, circuit boards and hardware products.

The MoU was exchanged during the G20-Digital Innovation Alliance (DIA) national roadshow held at the Maker Village in Kochi. DUK Dean (Academics) Alex James exchanged MoUs with Industry Institute Interaction Cell coordinator of GECT Praseetha P. Nair and Shabeer S., head of the department of the Electronics and Communications Engineering at TKM College of Engineering.

According to Dr. James, the collaborations are aimed at bringing together DUK's research expertise in chip design and signal processing with that of the rich talent pool in the engineering colleges, fostering mutual research interests, start-ups and developmental activities between the staff and students. The engagement will also promote experiential learning as part of the programs, he said.

Prof. Asharaf S, Dean (Development), Digital University Kerala explains in simple terms to students all about Artificial Intelligence and Machine Learning. Watch the first episode aired by Kite Victers Edu. Channel



<https://www.youtube.com/watch?v=XaKXZTxpqN4>

Dr. Asharaf S is a computer engineer/scientist with extensive exposure in algorithms for machine learning. In addition to his current role as a Professor at IIITM-K/DUK, he also serves as a visiting faculty for MDP programs at Indian Institute of Management Kozhikode and as a Mentor in Kerala Startup Mission. He received his PhD and Master of Engineering degrees in Computer Science from Indian Institute of Science, Bangalore. He graduated in Computer Engineering from Cochin University of Science and Technology. After B.Tech, he has worked as a lecturer at T.K.M. College of Engineering, Kollam, and after PhD he has worked as a Research Scientist at America Online (AOL) R&D Labs and as an Assistant Professor at Indian Institute of Management Kozhikode. He is a recipient of IBM outstanding PhD student award 2006, IBM Shared University Research Grant 2015, IBM Open Science Collaboration Programme Grant 2017, and DBT/BIRAC/Bill & Melinda Gates Foundation Research Grant under Grand Challenges India program in 2019. He has published three books and more than 50 research papers in international journals and conferences. He served as the founding professor-in-charge of Maker Village Cochin and currently serves as the Professor-in-Charge of Kerala Blockchain Academy. His areas of interest include technologies and business models related to data engineering, machine learning, information retrieval and blockchains.

XploitMAP: Mapping Attackers Reachability to Secure Your

Network

Digital University Kerala (DUK) have developed a web-based and interactive security application, XploitMAP, to generate and visualize attackers' reachability in an organizational network.

XploitMAP can be used to analyse the network data and suggest defenses to secure your organization.



In collaboration with KIMSHEALTH Cancer Centre, the Social Engagement Cell of DUK has organized a Breast Cancer Screening Camp on April 7, the World Health Day, at the NSS Karayogam Hall, Melthonnakkal. Pradeep Kumar K. Coordinator of the Social Engagement Cell organised the programme. DUK volunteers, Abhijith S, Muhammed Anwar Khan, Lekshmi Sundar, and Rohit Joseph Gomez, played an essential part in organizing the event. Pradeep Kumar K. and Dr. Satheesh Kumar, Chair of SoDiHLA along with the student volunteers, were present during the event and assisted Dr. Shabin from KIMS Cancer Centre in the successful completion of the program.

The camp aimed to raise awareness of breast cancer and the importance of early detection. Breast cancer is the most common cancer among women worldwide, and early detection can improve treatment outcomes and survival rates. Regular screening is essential for early detection, and camps like these are important in promoting breast cancer awareness and screening.



Twenty-eight villagers attended the camp and were educated on breast cancer awareness, including the various risk factors and the importance of early detection. The villagers appreciated the efforts of the organizers and volunteers of the Social Engagement Cell of DUK and KIMS HEALTH Cancer Centre. The Social Engagement Cell is committed to organizing more such camps to promote health awareness and provide access to healthcare services to underserved communities in the adopted villages of DUK. The organizers and volunteers are committed to organizing more such camps to promote health awareness and provide access to healthcare services to marginalized communities.

Portable IoT enabled pH meter

Dr. Jose Joseph (Assistant Professor Digital University Kerala) and his team in the School of Electronic Systems and Automation developed a portable, IoT enabled pH meter in collaboration with Indian Institute of Science Bengaluru (IISc Bangalore). This pH meter is devoid of any fragile components as sensing elements, making it a robust meter for real time applications. The project is funded by the Ministry of Electronics & Information Technology, Government of India,(MeitY),through the funding scheme NNetRA.



Device for Intraoperative Auto-transfusion

The team of Prof. John Eric Steephen from the School of Digital Sciences, Digital University Kerala created a device for Intraoperative Auto-transfusion to help save patients who lose significant volumes of blood in emergencies like ruptured ectopic pregnancy in remote areas where access to blood banks is limited. This patent-pending gravity-driven device collects, filters and reinfuses the blood lost by patients back into their circulatory system.



The device developed by Digital University Kerala researchers can save lives in emergencies like ruptured ectopic pregnancy

Resume Building workshop for the 2023 batch

As part of the placement activity and to address the immediate concern expressed by the final-year students, a workshop on Resume Preparation and email etiquette is held on 1st April 2023 coordinated by the Placement team of DUK. The session was conducted in a hybrid mode. The students who are doing internships outside TVM attended the workshop online via Zoom facilities

Workshop Facilitator: Ms. Sangeetha Panickar



PGCSBM Batch 2 Physical Networking session

Physical Networking Session 2 was conducted for Batch 2 Post Graduate Certificate Program on Entrepreneurship: Small Business Management with 150 participants on 27 April 2023 at Digital University Kerala. It was an online simulation on Business Strategy conducted in a workshop Mode. The School of Digital Humanities and Liberal Arts facilitated the one-day workshop.



One-day experiential learning program conducted by Digital University Kerala

One-day experiential learning program to support enhancing the student capabilities in developing digital marketing platforms for the students of KERALA AGRICULTURAL UNIVERSITY, COLLEGE OF AGRICULTURE, Vellanikkara, Thrissur was conducted on 11 April 2023. 40 students and 3 Professors from KAU attended the day-long experiential learning program. The session started with an introduction and context setting by Dr. Sini V Pillai and she clearly explained the relevance of technology in agriculture highlighting innovations in Agriculture 4.0. Prof. Satheesh Kumar gave an outline of Digital Marketing. Mr. Sreedas from D.U.K. Agri project gave insights into Digital Technology Applications in Agriculture. Prof Radhakrishnan T. from School of Digital Sciences provided insightful details of GIS for Agriculture. Dr. Jose Joseph took a session on Sensors and sensor technology in Agriculture and Mr. Adarsh From Kerala Block Chain Academy introduced Blockchain applications in Agriculture.



Publications

- S. S. Thomas; J. Palandri; M. Lakehal-ayat; P. Chakravarty; F. Wolf-Monheim; M. B.Blaschko, " Kinematics Design of a MacPherson Suspension Architecture based on Bayesian Optimization," in IEEE Transactions on Cybernetics, vol. 53, no. 4, pp. 2261-2274, Apr 2023.
- R. Badarinath; B. K. Raju; M. Anshad K; V. Prabhu; S. S. Thomas, "Real-time Vision Sensor for Volumetric Flowrate Estimation in Robotic Fused Filament Fabrication," in IFAC World Congress, Yokohawa, Japan, Jul 9-14, 2023.
- SERB, Department of Science and Technology under Accelerate Vigyan 2023 has funded Image and Vision Computing Lab headed by Dr. Sinnu Susan Thomas to provide opportunities to promising PG students from universities and colleges to get exposure and hands-on research experience.

Invited Talk

Ms. Kavya Manohar, Computational Linguist, Virtual Resource Centre for Language Computing delivered a session on "Automatic Speech Recognition" at UGC Stride Faculty Development Programme and International Conference at WMO College, Kalpetta, Wayanad on 28th April, 2023.

Blog on Web3 Trends, Regulations to Watch

- <http://medium.com/p/af332391e0df#01cd-275405e316c9>
- <http://medium.com/@kbaiiitmk/web3-buzzwords-social-trends-to-watch-de6bffda220b>



Knowledge Centre News

Software of the month

Weava highlighter

(Go to the Web store of Google <https://chrome.google.com/webstore/> and search for Weava)

Weava is a free and easy-to-use highlighting tool for Websites and PDFs. It is a Chrome extension. With Weava you can highlight websites and PDFs with multiple colors, and make annotations. Revisit them with a single click, organize your highlights into folders and sub-folders, and create citations automatically for your highlights.

It also helps in accessing your highlights anywhere. Your highlights and notes are saved in the cloud.



Website of the month

FreeTechbooks

(<https://www.freetechbooks.com/>)

This site lists free online computer science, engineering, and programming books, textbooks, and lecture notes, all of which are legally and freely available over the Internet. All the books listed on this site are freely available. You are allowed to view, download and with very few exceptions, print the books for your own private use at no charge. In fact, you are encouraged to tell others about the books.



Book Review of the Month

151 Solitary Days at Sea Sailing Non-Stop Around the Globe by Abhilash Tomy



Cdr. Abhilash Tomy, Indian Naval Officer (Retd.), became the first Indian to do a non-stop unassisted solo circumnavigation of the planet on a 56 foot long sailboat named Mhadei as part of Sagar Parikrama II in 2013. He had shared his introspections and musings of his adventurous journey through the book '151 Solitary

Days at Sea Sailing Non-Stop Around the Globe'. He had completed the Golden Globe Race 2022 in 29th April 2023 with second position.

He had started his solitary journey on 1 November 2012 from the Port of Mumbai and had travelled for 5 months, 151 days in exact, through vast oceans, across the longitudes, covering all the capes and sailed back where he started the journey on 31 March 2013. One of the most striking aspects of the book is the author's deep appreciation and reverence for nature. He starts out by reminding us of Mahatma Gandhi's famous quote, "Earth provides enough to satisfy every man's needs, but not every man's greed."

The author paints a vivid picture of the sea, its beauty, and its unforgiving nature. He recounts encountering albatross, dolphins and whales, admiring the sky's shifting hues, and having guests on his yacht, giving the impression to the reader that they are travelling with him. Some of the chapters also details a few fascinating situations involving other ships and boats that were travelling close by him.

Apart from the tranquillity, he struggles to keep his boat afloat while sailing through the perilous waves. He grapples with his emotions of isolation and dread, while he is in awe of and filled with amazement at the beauty of the world around him. He writes with honesty, which gives readers a true glimpse of his psyche.

As a whole, '151 Solitary Days at Sea Sailing Non-Stop Around the Globe' is a thought-provoking and inspiring read that transports the reader to another world. The author's narration is engrossing and perceptive, giving readers a fresh understanding of the size and complexity of the world we live in. It whets the readers' curiosity for discovering the wonders of ocean. It is a must read for anyone who loves adventure, nature and self discovery.



JITHIN P
 Assistant, Exam Office

*"Earth provides enough to satisfy every man's needs,
 but not every man's greed."*

-Mahatma Gandhi

New Additions to the Knowledge Centre Collection

Cloud Computing

Written in a tutorial style, this comprehensive guide follows a structured approach explaining cloud techniques, models and platforms. Popular cloud services such as Amazon, Google and Microsoft Azure are explained in the text. The security risks and challenges of cloud computing are discussed in detail with useful examples. Emerging trends including mobile cloud computing and internet of things are discussed in the book for the benefit of the readers. Numerous review questions, multiple choice exercises and case studies facilitate enhanced understanding. This textbook is ideal for undergraduate and graduate students of computer science engineering, and information technology.

Source :Amazon

Bhowmik, Sandeep(2022) *Cloud Computing* . New York, Cambridge University Press.



The Art of Feature Engineering: Essentials for Machine Learning



When machine learning engineers work with data sets, they may find the results aren't as good as they need. Instead of improving the model or collecting more data, they can use the feature engineering process to help improve results by modifying the data's features to better capture the nature of the problem. This practical guide to feature engineering is an essential addition to any data scientist's or machine learning engineer's toolbox, providing new ideas on how to improve the performance of a machine learning solution. Beginning with the basic concepts and techniques, the text builds up to a unique cross-domain approach that spans data on graphs, texts, time series, and images, with fully worked out case studies. Key

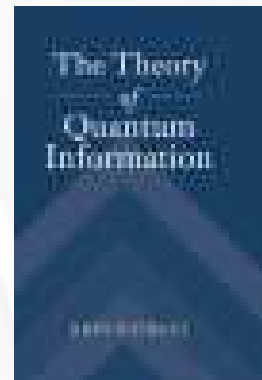
topics include binning, out-of-fold estimation, feature selection, dimensionality reduction, and encoding variable-length data. The full source code for the case studies is available on a companion website as Python Jupyter notebooks.

Source :Amazon

Duboue, Pablo(2020) *The Art of Feature Engineering: Essentials for Machine Learning*, New York, Cambridge University Press.

Theory of Quantum Information

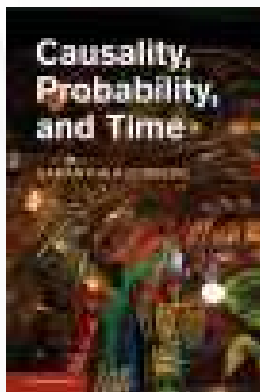
This largely self-contained book on the theory of quantum information focuses on precise mathematical formulations and proofs of fundamental facts that form the foundation of the subject. It is intended for graduate students and researchers in mathematics, computer science, and theoretical physics seeking to develop a thorough understanding of key results, proof techniques, and methodologies that are relevant to a wide range of research topics within the theory of quantum information and computation. The book is accessible to readers with an understanding of basic mathematics, including linear algebra, mathematical analysis, and probability theory. An introductory chapter summarizes these necessary mathematical prerequisites, and starting from this foundation, the book includes clear and complete proofs of all results it presents. Each subsequent chapter includes challenging exercises intended to help readers to develop their own skills for discovering proofs concerning the theory of quantum information.



Source :Amazon

Watrous, John (2018) *The theory of quantum information* . New York, Cambridge University Press.

Causality, Probability and Time



Causality is a key part of many fields and facets of life, from finding the relationship between diet and disease to discovering the reason for a particular stock market crash. Despite centuries of work in philosophy and decades of computational research, automated inference and explanation remains an open problem. In particular, the timing and complexity of relationships has been largely ignored even though this information is critically important for prediction, explanation, and intervention. However, given the growing availability of large observational datasets including those from electronic health records and social networks, it is a practical necessity. This book presents a new approach to inference (finding

relationships from a set of data) and explanation (assessing why a particular event occurred), addressing both the timing and complexity of relationships. The practical use of the method developed is illustrated through theoretical and experimental case studies, demonstrating its feasibility and success.

Source :Amazon

Kleinberg, Samantha (2018) *Causality, Probability and Time* . New York, Cambridge University Press.

Modern compiler implementation in C

This textbook describes all phases of a modern compiler: lexical analysis, parsing, abstract syntax, semantic actions, intermediate representations, instruction selection via tree matching, dataflow analysis, graph-coloring register allocation, and runtime systems. It includes good coverage of current techniques in code generation and register allocation, as well as functional and object-oriented languages, that is missing from most books. The most accepted and successful techniques are described in a concise way, rather than as an exhaustive catalog of every possible variant.



Source :Amazon

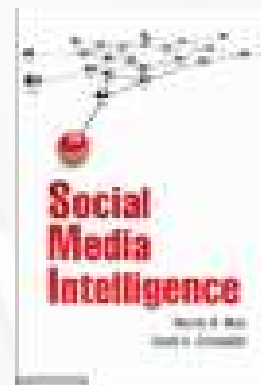
Appel, Andrew W(2018) *Modern compiler implementation in C* . New York, Cambridge University Press.

Social media intelligence

In the world of Facebook, Twitter and Yelp, water-cooler conversations with co-workers and backyard small talk with neighbors have moved from the physical world to the digital arena. In this new landscape, organizations ranging from Fortune 500 companies to government agencies to political campaigns continuously monitor online opinions in an effort to guide their actions. Are consumers satisfied with our product? How are our policies perceived? Do voters agree with our platform? Measuring online opinion is more complex than just reading a few posted reviews. Social media is replete with noise and chatter that can contaminate monitoring efforts. By knowing what shapes online opinions, organizations can better uncover the valuable insights hidden in the social media chatter and better inform strategy.

Source: Amazon

Moe, Wendy W (2017) *Social media intelligence*. New York, Cambridge University Press.



Corporate Finance for Dummies



Score your highest in corporate finance The math, formulas, and problems associated with corporate finance can be daunting to the uninitiated. Corporate Finance For Dummies introduces you to the practices of determining an operating budget, calculating future cash flow, and scenario analysis in a friendly, un-intimidating way that makes comprehension easy. Corporate Finance For Dummies covers everything you'll encounter in a course on corporate finance, including accounting statements, cash flow, raising and managing capital, choosing investments; managing risk; determining dividends; mergers and acquisitions; and valuation. Serves as an excellent resource to supplement coursework related to corporate

finance Gives you the tools and advice you need to understand corporate finance principles and strategies Provides information on the risks and rewards associated with corporate finance and lending With easy-to-understand explanations and examples, Corporate Finance For Dummies is a helpful study guide to accompany your coursework, explaining the tough stuff in a way you can understand.

Source: Amazon

Taillard, Michael(2022) *Corporate Finance for Dummies* . New York, Cambridge University Press.

Social Media Mining: An Introduction

The growth of social media over the last decade has revolutionized the way individuals interact and industries conduct business. Individuals produce data at an unprecedented rate by interacting, sharing, and consuming content through social media. Understanding and processing this new type of data to glean actionable patterns presents challenges and opportunities for interdisciplinary research, novel algorithms and tool development. Social Media Mining integrates social media, social network analysis, and data mining to provide a coherent platform to understand the basics and potentials of social media mining.

Source: Amazon

Zafarani, Reza(2020)*Social Media Mining: An Introduction*. New Delhi, Cambridge University Press.



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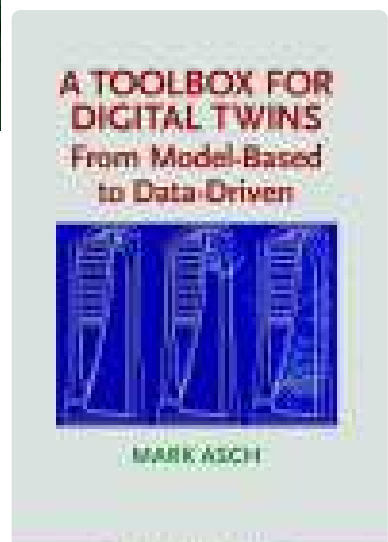
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