Preface

Welcome to the 4th ETLTC International Conference on Information and Communications Technology held virtually and hosted at the beautiful campus of the University of Aizu, Japan from January 25-28, 2022. The conference was organized by the ETLTC, with technical support from the ACM Chapter on eLearning and Technical Communication, and hosted and partially funded by the University of Aizu.

The ETLTC was privileged to have received active support from the following partner universities:

- Karlsruhe University of Applied Sciences, Germany
- The University of Monterrey, Mexico
- The University of Western Macedonia, Greece
- Christ University, India
- The University of Sunderland, UK

and many other partner universities participating with excellent presentations and papers. ETLTC would also like to thank industry patrons such as the Japanese Technical Communicators Association (JTCA), Docufy, Schema, iViews, and ICIET among others.

The response to the conference's call for papers has been excellent and the attendance at the online conference was equally impressive. We had representation from more than 15 countries with over 75 accepted papers for the proceedings after multiple rounds of peer review.

Many good projects undertaken by students get unnoticed and unappreciated. The conference is specially designed to provide opportunities for students to make formal presentations based on papers and projects that they complete for their coursework, special projects, internships, or thesis.

The conference officially accepted papers under 6 different tracks -

- Technology-Assisted Language Learning
- Educational Technology
- AI for Data Analysis, Big Data, Cloud & Robotics
- Technology & Smart City
- Technical Communication and Design
- Biomedical Engineering and bioinformatics

There's a very bright outlook for computer science students in today's world. Computer science graduates have some of the highest starting salaries and are in high demand allowing them to be picky about the type of job and industry they opt for. There are many reasons why. Technology has been changing rapidly and growing so exponentially over recent years, there has been a steadily increasing demand for bright graduates to come in and help to transform areas ranging from data infrastructure to AI, cyber security, and other aligned fields. It's important for people interested in pursuing a career in computer science, to engage in and stay up to date with the latest trends in computer science research, and to make an informed choice about where to head next.

We increasingly see multiple trends in the field of computer science and technology.

With the emergence of the industrial internet of things, referring to interconnected sensors, instruments, and other devices networked together with computers' industrial applications, including manufacturing and energy management, it's no wonder that the global robotics industry is set to be worth US$80 billion by 2024, and a large portion of this growth is down to the strength of interest and investment in artificial intelligence (AI) – one of the most controversial and intriguing areas of computer science research. The technology is still in its infancy, but tech giants like Facebook, Google, and IBM, among many others, are investing huge amounts of money and resources into AI research.

From banking to healthcare, big data analytics is everywhere, with companies increasingly making attempts to better use the enormous datasets they have, in order to personalize and improve their services, more towards intelligent information access and delivery. This also leads us to the discussion of technical communication topics at ETLTC, where we redefine and reassess the genre of study, and the profession of technical communicators from being document producers to intelligent topic-based information access, archiving, and delivery managers.

Technology-assisted learning and education technology have been gaining tremendous importance over the last decade, and with the pandemic around, the world has embraced elearning like never before, and it seems like an irreversible trend. Computer-assisted education brings many benefits and has many uses. From students with

learning disabilities to providing personalized instruction and enabling students to learn at their own pace, freeing the teacher to devote more time to each individual, it comes with multiple advantages with virtual-physical presence. It has its share of challenges, but that's what we at ETLTC try to identify and discuss.

Some of the papers at ETLTC2022 also looked at another tremendously important area of study in computer science - bioinformatics. With a fascinating application of big data, bioinformatics encompasses the use of programming and software development to build enormous datasets of biological information for research purposes and carries enormous potential. The genre of study successfully links big pharma companies with software companies, with enormous ability to solve big problems in healthcare, and medical science. Bioinformatics is growing in demand and offers good job prospects for computer science researchers and graduates interested in biology, medical technology, pharmaceuticals, and computer information science.

Increasingly, we are witnessing universities that are offering double majors to their students in biomedical engineering and computer science. Such a new curriculum draws on longstanding collaborations between both departments, and it establishes a clear map to graduation for students interested in careers in biotechnology and at companies like Google, Amazon, and Microsoft. This is an emerging area of study for students who are interested in medical software and technology but aren't necessarily drawn to medical device design. As Duke University puts it on their website that "the BME and CS program will cater to students more interested in the science behind optimizing algorithms and machine learning, who want to pursue jobs at Google, Apple or tech companies that may have a health component rather than a large health focus." The Biomedical Engineering and Bioinformatics track at the ETLTC would like to engage in a dialogue that helps us understand the field better.

Another area we looked at the ETLTC is architectural technology or building technology - which is the application of technology to the design of buildings. With the population in cities exploding, and demands for more environmentally friendly design, the ETLTC thinks it's valuable to include a discussion of technical design and expertise used in the application and integration of construction technologies in the building design process. With limited resources and demands for quick and user-friendly decision-making, computer simulation in architecture is important like never before. Such trends helped usher in a new dynamic into the architecture workplace in which engineers, among others, could interject themselves into the design process via virtual tests of a building. The papers in the "Technology and Smart City" track at the ETLTC helped to further dispel and discard the approach that too often in schools, architecture is still taught as the work of a sole practitioner who independently conceives and refines an architectural idea and hands it off to someone who builds it according to the specifications. It never actually happens that way.

It's in this scenario that our ETLTC conference series becomes important where the participating students and faculty can engage in a dialogue and network about the gap between the existing and emerging practices, the immense opportunities available to develop real-world applications of the technology, and further explore the immense scope for break-through moments in this field. ETLTC will continue to strive for greater heights and expand the network in a way to engage more participating organizations and universities.

We would like to take this opportunity to cordially invite you to participate in the ETLTC2023 conference that is expected to be hosted both virtually and face-to-face from the University of Aizu, Japan.

We are looking forward to seeing you at the next conference, ETLTC & ICETM 2023.

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