Anubhav: A Newsletter by iHub-Anubhuti

A year gone by....

I welcome all to the New Year and wish everyone and their families a new year full of hope, good health and a fulfilling life. Last month saw completion of one year of operations of iHub Anubhuti-IIITD Foundation. The company got incorporated on 21st Dec'20 with an endeavour towards building a collaboration between industries, academia and government agencies on developing data driven cognitive computing solutions, mainly in four verticals - Health, Law Enforcement & Security, Education and Environmental Sustainability. I am happy to share the journey since inception.

We sanctioned funds to 28 research projects from all over the country across healthcare, legal informatics, education and sustainability centred around cognitive computing and social sensing. Work has started on these projects and I am sure in times to come these would definitely make an impact on people and society. Each of these projects is trying to solve a particular problem using cognitive computing and social sensing, AI and ML. The society's biggest problems can also be our biggest opportunities. These projects are in following domains: Predicting mortality/diagnosis/diagnostic tools for patients suffering from cancer/liver failure, Challenges in Public Health, Cognitive Computing and Social Sensing and Law Enforcement and Security.

**Mukesh Malhotra, CEO,
iHub Anubhuti-IIITD Foundation**

We also announced the call for the Chanakya fellowships for UG and PG students across country. This initiative provides a platform for the students to work on a real problem of industry and solve it using CPS. The students are getting monthly fellowships and they will be working on technological models to solve the societal problems. We have already issued the sanctions letters to all the deserving students and work has started on these projects. Fellowships like this not only help to achieve our objective of HRD and Skill Development but importantly outcomes from these projects also help in solving some of the problems and issues that the society is facing.

Both the above initiatives- Research Projects and the Fellowship Program would go a long way in helping us meet the NM-ICPS objectives of technological development of product and services, entrepreneurship development, Human Resource development and collaborations. Not only that, TiH will also nurture start-ups that can come out of these projects for furthering their entrepreneurial efforts. I would urge all the PIs and

students to come out with POCs/prototypes which we can showcase to the VCs/other Investors and convert these research projects to start up companies and scale them up. We will extend all the possible support to PIs and others in taking care of formalities related to setting up of companies.

So in a way, through the advancement of research and development we are also driving entrepreneurial initiatives. With focussed approach on driving research and innovation, all these initiatives aim to encourage entrepreneurship and in turn yield results on a national scale.

We also signed an MoU with TiH of IIT Delhi for setting up of Medical Cobotics Centre (MCC) at IIITD. Both TiHs have conjoined their objectives for growth, research and development in arena of Medical field to align the same with AI and Robotics. This is going to be a multipurpose facility for enhancing R&D in Medical Simulators, Digital Health and Healthcare Robotics.

We continue the outreach activity through our monthly webinars also. Regularly communication through press release in major publications and via blogs on various forums like LinkedIn and Medium also happen regularly. You can follow us across all social media platforms and get updated on these various initiatives.

We are about to release a call for startups/incubations. The startups we plan to nurture could be using cognitive computing/AI/ML/HCI to solve problems in the areas of Healthcare, Legal, Education and Sustainability. For all the entrepreneurs and budding entrepreneurs, this would be a good opportunity to get funded and incubated in TiH ecosystem.

Lastly, for any organization to scale up, it is important to have a good governance system. We have a good Governance and Risk Management in place and have a regular process of having BOD and HGB meetings wherein the entire strategy and operational initiatives are discussed.

We also ensure that statutory compliances and regulatory requirements are adhered to. The closing of the financials for FY21 and completion of Statutory audit also happened laying a robust foundation to our organization.

All these would not have been possible without the great team we have comprising of Harprit, Souravi and Gaurav. We are fortunate to have a BOD with strong credentials consisting of Prof. Ranjan, Prof. Pushpendra, Prof. Vikram and Dr Tanmoy. With all of us together it is a great winning team. It is great to have support of IIITD faculty and Administrative staff in our various initiatives and operational processes.

We at iHub Anubhuti look forward to working with all of you in developing technologies and solutions which can make this world a better place and also fulfil your dreams of research and entrepreneurship.

Setting up Medical Cobotics Center

iHub Anubhuti, the TiH of Indraprastha Institute of Information Technology Delhi (IIITD) and I-Hub Foundation for Cobotics (IHFC), the Technology Innovation Hub (TIH) of Indian Institute of Technology Delhi (IIT Delhi), recently signed a MoU to set up India's first Medical Cobotics Centre (MCC) at IIIT-Delhi. The ceremony was held in the presence of Prof Ashutosh Sharma, former DST Secretary as the Chief Guest.

Medical Cobotics Centre (MCC) will be a technology-enabled medical simulation and training facility for the young resident doctors besides acting as a validation centre for the research outcomes in the area of healthcare robotics and digital health. The centre would facilitate the training of healthcare professionals, paramedical staff, technicians, engineers, and researchers.


Chanakya Fellowships Announced

iHub Anubhuti announced the Comprehensive and Holistic Advancement of National Knowledge Yield and Analytics (CHANAKYA) fellowship through an open call for inviting applications for UG and PG fellowships in the domains of Healthcare, Education, Cognitive Computing and Social Sensing, Legal and Sustainability.

Under this, iHub Anubhuti granted 28 UG fellowships and 4 PG fellowships.

The objective of iHub Anubhuti's CHANAKYA fellowship is to provide a platform for the students to work on a real problem of industry and solve it using CPS.
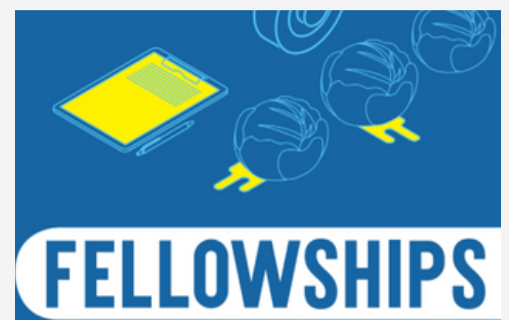
EngageMe: Multimodal Analysis of Attention among Children with Attention Deficit Hyperactivity Disorder for Digital Larning
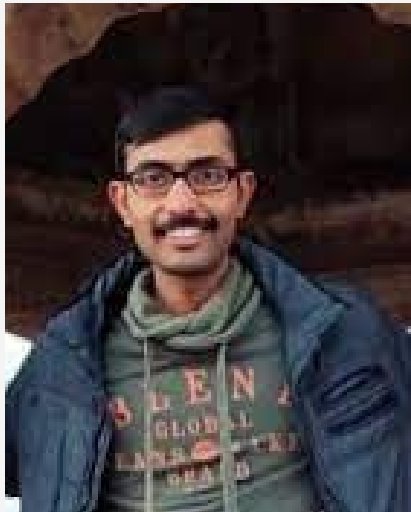
Blog by Dr. Jainendra Shukla

Specific Learning Disabilities (SLDs) refer to a category of developmental disorder of scholastic skills (like reading, writing, calculations, etc.), not attributable to mental retardation, neurological deficit, sensory or emotional problems [1]. The SLD conditions manifest as a deficit in processing language, spoken or written, that may manifest itself as a difficulty to comprehend, speak, read, write, spell, or to do mathematical calculations and includes such conditions as perceptual disabilities, dyslexia, dysgraphia, dyscalculia, dyspraxia, and developmental aphasia. SLD interferes with the normal learning process of the person. One-third of people with learning disabilities are estimated to also have attention-deficit hyperactivity disorder (ADHD). Further, it is estimated that nearly 5-15% of children struggle with Specific Learning disabilities (SLDs) in India [2].

The cognitive flexibility associated with SLDs can manifest itself in noteworthy talents, which include a multi-sensory lens for creative and lateral thinking, resulting in out-of-the-box solutions for problems. The untapped potential of SLDs causes high opportunity costs for the Nation's progress. However, prevailing learning environments for SLDs create disparity in the education system, trigger divergence from the policy of 'Learning for All (NEP-20)', and depart from the provisions of 'The Rights of Persons with Disabilities Act (2016)'. Feelings of isolation and a loss of interest in learning are often reflected in children with SLDs. Children with SLDs experience repeated failures and poor performance despite their continuous efforts and practice in learning [3]. At the same time, worldwide, the condition with SLDs has been exacerbated due to the COVID-19 pandemic when education delivery shifted online. According to global experts, "Future of Schools" is a hybrid model, where students will be both; on & off-campus. Thus, strengthening online education delivery will be important and impacting. However, research has indicated that educators might not always be aware of their students' attentional focus, and this may be particularly true for novice teachers [4]. The effort further increases when a single educator has to monitor the attention of the class at the individual level rather than the group level and across the entire class duration. Hence, technological tools that can improve and monitor the attention of children with SLDs can play a significant role in their inclusion during digital learning.

"EngageMe" aims to develop an intelligent platform that will offer personalized, monitored and evidence-based identification of attention levels among children with SLDs during digital learning. We will employ novel sensing technologies for multimodal behavioral analysis of the child's online engagement using physiological, behavioral, and contextual information in a non-intrusive manner. Using Artificial Intelligence (AI) and Machine Learning (ML), we aim to better understand the cognitive state and affective processes behind attention and engagement during digital learning. Further, we will develop intelligent just-in-time and just-in-place interventions that can enhance the digital learning experience and better support emotional wellbeing among children with SLDs. EngageMe will help the special educators and pedagogues in reaching an objective and reliable assessment of the child's attention level during online learning.

Given the ongoing pandemic scenario, currently, we are collecting data using an online portal. One can head over to https://www.specialeduneeds.com/ to know their attention level by performing a sequence of three different simple and interactive psychological tasks. We look forward to building new collaborations with researchers, special educators, care facilities working with children with SLDs working around the country.

Thanks to the support provided by iHub Anubhuti, we are excited to bring this project to fruition and look forward to enabling the untapped potential of children with SLDs.

About the Principal Investigator

Dr. Jainendra Shukla leads the Human-Machine Interaction (HMI) Lab [https://hmi.iiitd.edu.in/] at Indraprastha Institute of Information Technology, Delhi (IIIT-Delhi). He is an Assistant Professor at the Department of Computer Science and Engineering in joint affiliation with the department of Human-Centered Design. He is also serving the Centre for Design and New Media as the head and is associated with Infosys Centre for Artificial Intelligence. He is experienced in Affective Computing, Human-Computer Interaction, and Social Robotics.

References:

[1] Singh, S., Sawani, V., Deokate, M., Panchal, S., Subramanyam, A. A., Shah, H. R., & Kamath, R. M. (2017). Specific learning disability: A 5-year study from India. Int J Contemp Pediatr, 4(3), 863-8.
[2] Ministry of Social Justice and Empowerment. Notification, 2018, Gazette of India (Extra-Ordinary) Department of Empowerment of Persons with Disabilities (Divyangjan) 2018. Jan 4, [Last accessed on 2021 Dec 12], https://groups.google.com/g/wethepwd/c/XuRiT0VdWsg
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[4] Goldberg, P., Sümer, Ö., Stürmer, K., Wagner, W., Göllner, R., Gerjets, P., ... & Trautwein, U. (2019). Attentive or not? Toward a machine learning approach to assessing students' visible engagement in classroom instruction. Educational Psychology Review, 1-23.

AI for Computational Social Systems (ACSS 2021)

Jointly organized by the Laboratory for Computational Social Systems (LCS2), iHuB Anubhuti IIITD Foundation and the Department of CSE, IIITD

The ACSS workshop was organized on the broad theme of social computing and natural language processing. Eminent speakers from industry and academia were invited to give talks on their research. It was a 2-day event. The first day was virtual and the second day was physical.
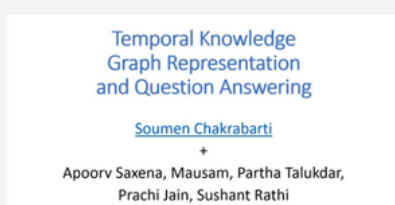
Students across India also participated and gave talks. There was a student paper competition, where the top three student speakers were given awards.

Webinar Series

1 **November** webinar was on "Towards Artificial Vikramaaditya: Can Machines Deliver and Explain Fair Judgments?" by Arnab Bhattacharya, Professor, CSE, IIT, Kanpur

2 **December** webinar was on "Understanding Semantic Web and its Applications" by Asha Subramanian, Founder and CEO, Semantic Web India Private Limited

3 **Upcoming webinar on January** will be on "AI in Blood Cancer Imaging" by Anubha Gupta, Professor, ECE, IIIT Delhi

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