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# About Technopark@iitk

IIT Kanpur Research and Technology Park Foundation is the institute's first research and technology park that was set up under the brand name of Technopark@iitk on 7<sup>th</sup> Feb. 2019. It is a not-for-profit section 8 company set up under the Company Act, 2013 with the aim to enable translational research and two-way flow of knowledge and resources between academia and industry. With the aim of becoming a hub of R&D activities spanning all industrial sectors and innovating in critical sectors of economy, Technopark@iitk offers intellectual capital, research infrastructure and physical spaces to industries to relocate their R&D centers and have both short- and long-term strategic collaboration with the faculty and students of the IIT Kanpur. The facility was inaugurated formally on 8<sup>th</sup> April 2019 by the Chairperson, Board of Governors of IIT Kanpur, Dr. K. Radhakrishnan.

In a very short span of time, Technopark@iitk successfully collaborated with six industries working in different technical backgrounds like, Promorph Solutions, Injectoplast, VTOL Aviation India Ltd., E-Spin, Kanopy Solutions and iSMRITI and is in talks with many national and international companies.



Prof. Avinash Kumar Agarwal talks about the success of Technopark@iitk and its future.

# Featured Interview

## Prof. Sandeep Shukla, Joint Co-coordinator of Cyber Security Cell, talks about C3I and its unique features.



### 1. When was C3I established and what are its objectives?

The C3I Center was established in 2016 in IIT Kanpur for research, education, training and awareness campaign on cyber security of critical infrastructures. SERB funded it in March 2017. The Center focuses on critical infrastructures, power grid, industrial automation, water treatment, agriculture, and IT. One of the objectives of the Centre are to build methods, techniques & technology for making SCADA and Industrial Control IT system insider attack-proof and develop machine-learning algorithms for on-going cyber-attack with advanced persistent threats on power systems.

### 2. C3I has some great facilities like, Power System Testbeds, Malware Detection & Classification System, Cryptographic Hardware Design etc. Tell us about their functionality.

At C3I, we have India's first industrial scale testbed for power that includes thermal generation and solar generation facilities integrated with a scaled down transmission system testbed controlled and monitored by substation automation, generation automation – and with multiple OEM manufactured PLC, DCS and SCADA control. It is expected to be completed by December 2019.



We have developed a home grown threat intelligence monitoring and analytics system that has been set up to monitor all cyber events incident upon the center and corresponding analytics have been built and in use for last 1 year. Machine learning based detection of threats with high accuracy (above 95%) and with low false positive rate (less than 5%) have been implemented and is integrated into the threat intelligence monitoring system.



Many research projects undertaken in the last two years to detect and classify malware for Windows, Linux, Android platforms have produced a set of machine learning based tools that can not only distinguish a malware from a benign binary file, but also provide high accuracy classification of malware into multiple malware classes. The accuracy level of these tools' ranges from 90% for obfuscated and packed malware to 99% for plain malware.

C3I centre has also built many server honeypots (for SSH, FTP, HTTP, SQLDB etc.), as well as for IoT protocols such as CWMP and MQTT etc. These honeypots have been deployed to collect malware, attack signature and modus operandi, and to identify attack sources and attack timing etc.

C3I Center researchers have also extensively worked on designing cryptographic protocol implementations in hardware, and FPGA based prototyping. The integrating of these hardware modules protects the payloads for industrial protocols such as Modbus, 104, and 61850 are underway.

### 3. Tell us about some major accomplishments of the Centre.

The Center has signed MOUs with New York University, Tel Aviv University, Bombay Stock Exchange and National Stock Exchange. We recently signed a pact with Tech Mahindra to conduct a joint research in the field of cyber security. The partnership will bring real world industry exposure to the students of IITK.

### 4. What makes a center like C3I unique in India?

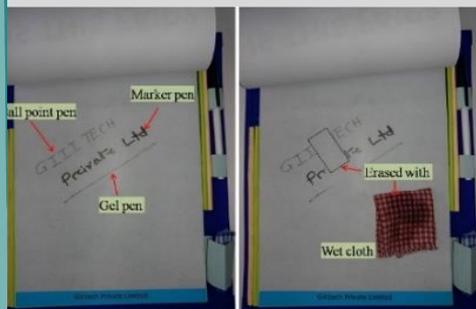
C3I is unique as it has a comprehensive research, development and training plan to build technology, to develop techniques and train manpower in protecting critical infrastructures from the cyber attackers.



# Technovation

## Reusable Paper

Prof. Animangsu Ghatak, Department of Chemical Engineering, has invented such a polymeric writing surface wherein the ink can be removed by simple wiping off with a wet cloth. The paper allows almost all types of conventional inks to be used for writing without requiring any specially prepared ink material. Whereas, on conventional paper, laser printing can be done only once, on the reusable polymeric paper, laser printing can be done multiple times, i.e. the printed image on paper can be wiped off with wet cloth and dried in atmospheric condition and reused again for printing. The quality of the printed image does not diminish over repeated cycles.



The present invention has made the use of this material suitable for writing and printing by roughening its surface, which enhances both frictional characteristics of the surface and its wettability. So, when a ball pen is slide past its surface, ink from the pen gets dispensed on it, the ink from different sources, e.g. ball pen, laser-jet can spread on it albeit to a limited extent and the ink can be easily removed by simple rinsing or wiping it with a wet cloth. The paper can be subjected to many such cycles of writing/printing – cleaning and rewriting without any loss of reusability. Prof. Ghatak believes that the use of reusable paper can significantly reduce.

## IITK Patents

### Microvalves for Fluidic Applications

**Patent Status** – Filed

**Indian Patent Application No.** – 3565/DEL/2015

**Inventors' Names** – Mr. Ramchandra Chepyala, Dr. Siddhartha Panda.

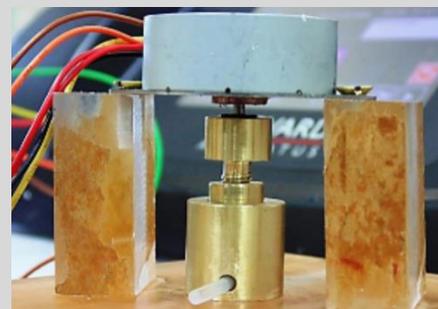
**Department** – Department of Chemical Engineering

**Patent Category** – Chemical and Life Sciences.

**Overview-** Microvalve to regulate the flow of analytes to the microfluidic devices.

#### Key Features-

- Mechanically operated micro valve for regulation of micro-litre volumes of the fluids through the flexible tubings without contacting the fluid in microfluidic devices.
- It can be fabricated in any material, which is machinable and have sufficient strength.
- It uses simple DC motor to regulate the flow in flexible tubings, hence the generation of heat during the operation is not there.
- It does not require different ratings for plunger/stem force.
- It is simple and easy to use multipurpose micro valve.



#### Applications – Microfluidic Companies

- Clinical and veterinary diagnostics.
- Industrial and environment.
- Drug delivery.
- Micro reaction technology.
- Analytical devices.
- Pharmaceutical and life sciences.
- Point of care diagnostics.

# Client in Focus

## Promorph Solutions



Promorph Solutions, founded by Mr. Onkar Prasad in 2015, is an education impact company. The Company envisages in transforming the public education of India by bringing in the systematic change leveraging technology, consulting, and education-focused research. Working on this mission, Promorph launched 'EmpowerU'. It has been implemented in the schools of Giridhi districts of Jharkhand and Khandalmal District in Odisha. The innovation provides real-time data from rural schools even without internet connectivity, which is a critical need for unconnected remote schools. The Analytical Dashboard provides Key Performance Indicators (KPIs) for Mid-Day Meal (MDM), Teachers' Attendance, Students' Attendance, Students Learning Outcome, Execution of Government Schemes, Infrastructure & Facilities and Grievances. The idea was awarded for "innovative Idea for use of Technology & Innovation in Promoting Good Governance" in 2014 by MHRD of India.



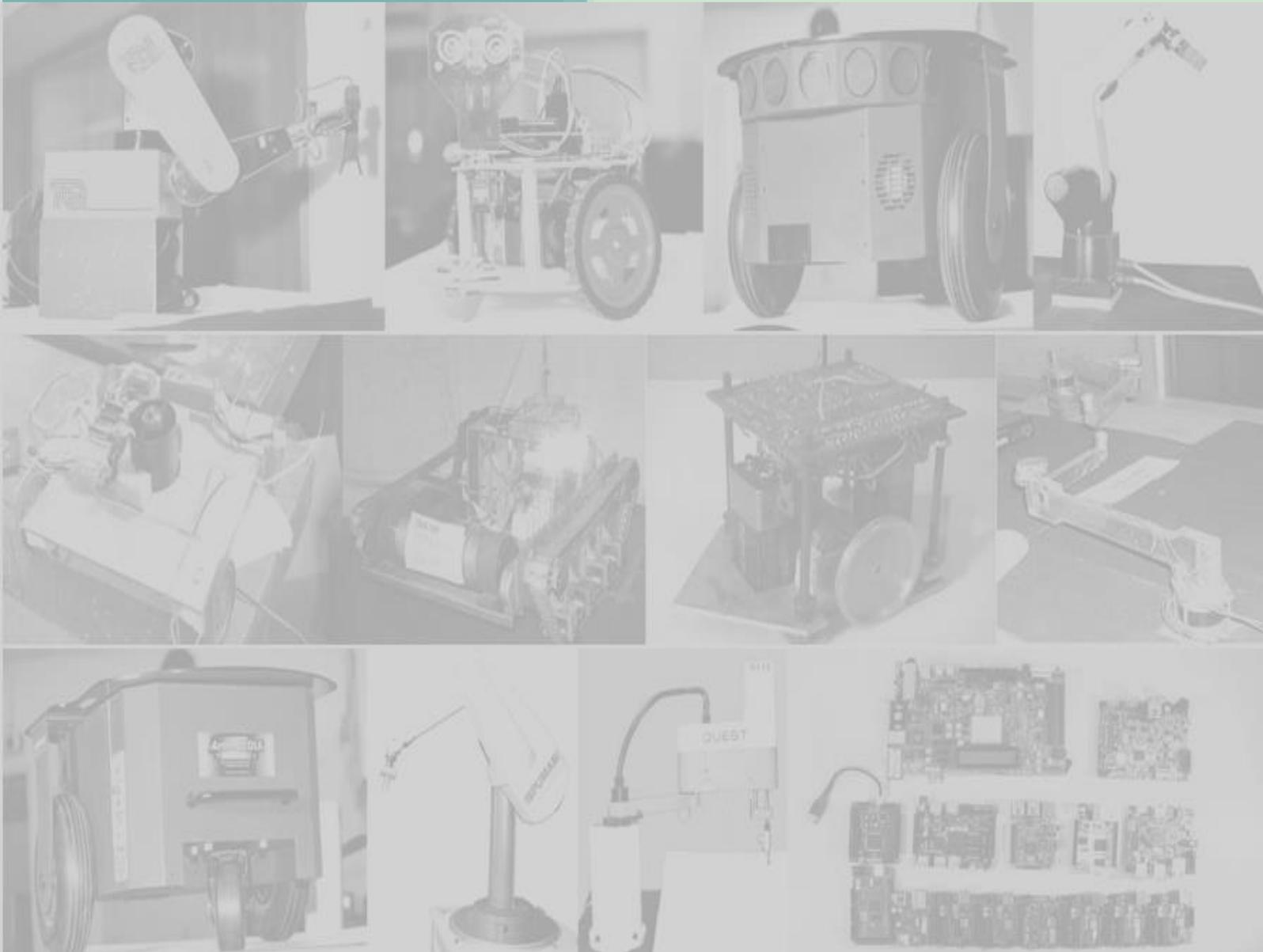
Funded by IIT Kanpur and Villgro Innovation Foundation, Promorph has earned many accolades. Promorph was featured in Forbes Magazine under Innovative factories in April 2019 and was selected among top 100 companies in Maharashtra Start-up Week organized by Maharashtra Innovation Society in January 2019.

## IITK/Clients in News

- Tripura Government collaborates with Promorph Solutions to prepare a data bank of state-run and state-aided schools, as part of its efforts to monitor the education system in the state.
- Science & Technology Council, Students' Gymkhana held an exhibition, SnT Pavilion 2019 for the Campus community. SnT Summer Camp was held for the student community and over 300 students, from various departments, enrolled to complete 45+ projects during the summer semester.
- IIT Kanpur developed mapping generation software for ISRO's lunar mission Chanrayaan-2 launched on 22<sup>nd</sup> July 2019. The software was developed by Prof. Ashish Dutta, Mechanical Engineering Department & Prof. K.S. Venkatesh, Electrical Engineering Department.

## Technopark@iitk News

- Technopark@iitk held Industry-Academia Kanpur Meet on 6<sup>th</sup> April 2019. Over forty local big industries and MSMEs participated.
- Technopark@iitk was officially inaugurated by the BOG Chairperson, Dr. K. Radhakrishnana on 8<sup>th</sup> April 2019.
- Technopark@iitk held Bundelkhand Defence Corridor Meet on 7<sup>th</sup> May 2019. It was presided over by Prof. Manindra Agrawal and the chief guest Mr. Awanish Awasthi CEO UPEIDA.
- The technical team of Lohia Group of Industries visited IITK and Technopark@iitk to foster collaboration on 6<sup>th</sup> June 2019.
- Technopark@iitk launched Industry-Student Engagement Program for IITK students to collaborate with the industry on 22<sup>nd</sup> June 2019.



***Spurring innovation & growth – Technopark@iitk invites industries to collaborate***

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