Research & Development
@ IIT Bombay

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Some Examples of Recent Technology Transfers- Society

ASAN: The Low Cost ATM
A Learning Based Tool for Automatic Address Segmentation
Palletized Tea Storage Methodology employing Controlled Atmosphere
Design & Development of Composites passenger coach doors for Railways
Modular FRP toilet units for Railways
A PC based communicator for children with special needs
Pedal power devices for rural applications
Animal driven battery charging unit
aAQUA web portal for providing information to farmers
Development of LPG stove for blind
Improved design of post boxes
Silicon Locket-for Cardiac monitoring
Artificial hand for amputees
Bio Char unit for charcoal production
Design & development of rehabilitation aids for physically handicapped using light weight polymers
Silicon Locket for Cardiac Monitoring

A web enabled heart monitoring device with a host of advanced features to accelerate modern treatment.

Prof. Rakesh K. Lal and Prof. Dinesh K. Sharma from the Microelectronics group at IIT Bombay.
Dr. Sunil D. Sherlekar from TCS.
Prof. Saumyo Mukherji has also been associated with this project since its inception. Vivek Vaid, Ashrut Ambastha and Sudip Nag have made major contributions to circuit and system building.
The custom IC for linear functions was designed by Mr. Maryam Shojaei.

aAQUA: almost All Questions Answered

Online expert Question & Answers based community forum for delivering information to the grass-roots of Indian Community.

www.aqua.org

Developmental Informatics Lab

Basis for SINE’s Agrocom
Computer Keyboard for Indian Languages
Prof. Anirudha Joshi and his team at the Industrial Design Centre (IDC)
A MediaLabAsia Project
Demonstration Projects carried out for various age groups thru road shows and competitions
Deployed in rural kiosks on the web

Geo Referenced Area Management (GRAM++)
A Geographic Information System (GIS) tool to assist in district level spatial data organization and planning.
Users: State & Central Govt., Academic Institution, R&D Organisation
Status: Support from DST / UNDP
Copyright protected
GRAM++ based application transferred to MP Govt.
Commercialising / reduced version for public domain

Basis for SINE’s Boogol GIS
Technologies for the Physically Challenged

“Science is People”

Prof. Alan MacDiarmid
Nobel Laureate (Chemistry), 2000
**Artificial Hand**


Artificial hand would cost less than Rs 10,000 as compared to the imported ones for more than 3 lakhs

Funded by the Ministry of Social Justice and Empowerment (MSJ&E) Suresh Devasahayam, R Lal, and P C Pandey.

The initial design was done at IIT Bombay, (Version-I), and after preliminary testing at the Rehabilitation Institute in Mumbai, clinical trials with long term follow-up was done at CMC-Vellore.

The design was revised substantially at CMC-Vellore in 2003, (Version-II), and production of the revised version started in 2004.
Technologies for the Physically Challenged – 2

• An LPG kitchen stove for the sight-challenged
• A communicator for Children with Cerebral Palsy
• Ascender: The Climbing Wheelchair
• Lightweight Rehabilitation Aids for Polio-affected Children
• Different Aids for Children with Cerebral Palsy

Technologies Developed – to be commercialised
Care must be taken to ensure that modern technology does not merely become a preserve but that its benefits reach also the fields and villages of rural India.

-Smt Indira Gandhi

-December 9, 1982, in a message to the Institute on the occasion of the Silver Jubilee Celebration of IIT Bombay
An estimated 13.5 lakh persons in India are dependent on bamboo for livelihood, of which 5-6 lakhs are involved in bamboo craft.

IIT Bombay has developed a number of technologies to bolster the unorganized craft sector by helping artisans produce value-added, contemporary bamboo products to compete with other materials in the urban and international markets.

- A tool-kit (Fabricated by: M/s Lamicraft) with 97 product-specific hand tools to process bamboo.
- Small hand-operated machines (Fabricated by: M/s Kadirus) for bamboo-processing, suitable for remote areas with unreliable power supply.
- Jigs, fixtures and moulds to aid control of sizes and give better finishes.
- Variety of treatments such as smoking, alum, etc. to prevent fungal and insect attacks and various surface finishes using natural dyes.
- New weaves and product designs for ergonomically, functionally and aesthetically improved products.

Prof. A G Rao,
Industrial Design Centre
Bio-Char Unit for Low Cost Production of Charcoal

Salient features of product are:
• simple to operate & non-polluting
• Is adaptable to other waste although developed for bamboo waste
• Uses the otherwise polluting gases as thermal fuel
• a uniform yield of 25% charcoal from bamboo waste, and about 28% charcoal from other woody biomass is obtained, with a consistent calorific value of 28MJ/kg

Demonstration Projects
A single person can operate the unit, which costs Rs. 35,000.
• A bio-char unit was set up at an activated carbon manufacturing plant in Hyderabad, where the suitability of bamboo charcoal as raw material was successfully demonstrated.
• Another BCU sponsored by KVIC is being put up at a bakery unit at Yusuf Mehrauli Centre, Tara Village, Maharashtra to demonstrate the use of thermal energy from gases for generating charcoal as a by-product.
• Through NMBA, 15 such units at five different locations in Tripura, Meghalaya, Bastar, Amravati and Pune districts are being deployed for training and further dissemination of the technology.
• A 10 kg batch unit was also demonstrated at the VII World Bamboo Congress, New Delhi. The BCU is expected to help generate rural employment, and ensure village energy security.
Engineered ecosystems may also be used for treatment of liquid wastes. Cultured Soil Filter Technology consists of impervious containment (typically 1.0 - 1.5m below ground), and incorporates soil, filtration media, soil organisms like earthworms, and plants.

- A cost-effective ‘green’ technology, suitable for all solid and liquid organic waste
- Very low energy consumption
- Bio-mineral fertilizers and soil as by-products
- No sludge production, unlike conventional units
- Self-sustaining revenue model

Applications
- Treatment of water for irrigation, construction, and soil application
- Industrial effluent treatment
- Processing solid wastes
- Non-chemical purification of swimming pools and drinking water
The technology has been adopted by several user-organisations

Basis for SINE’s Vision EarthCare

Prof. H S Shankar,
Chemical Engineering

Industrial Research & Consultancy Centre, IIT Bombay
Salient features of project are:

Karjat Taluka of Raigad district in spite of the heavy rainfall received here, many villages and hamlets face a severe shortage of drinking water in summer.

Project was to construct small dams in some of these hamlets with the main objective to hold enough water so that drinking water needs for the villagers and their livestock are met for the whole year.

Rough estimates for the dams are Rs. 12 lakhs for Belachiwadi and Rs. 18 lakhs for Gudwanwadi.

A large donation of Rs 20 lakhs by IITB alumni, Dr Shridhar Shukla, of G S Labs, Pune has helped taking this initiative further.
**Pedal Powered Battery**

A prototype unit is installed at YMC-TARA village Rural Industry centre in December 2003 with requisite training to the concerned technical staff. Initial feedback from the user has been very encouraging.

**Pedal Powered Potters Wheel**

A prototype unit is installed at YMC, TARA village rural Industry centre with requisite training to the concerned technical staff. Initial feedback from the potter having used the unit has been very encouraging.

Cost of Prototype: Rs.5000/-
Improvised Designs – for local adaptability
**ASAN: ATM Enclosure Design**

The design team won the Excellence in Consultancy Services – 2004 award for this Project on "Design of NCR EasyPoint 57i ATM: ASAN for NCR", given under Consultancy Development Centre National Awards, supported by DSIR Ministry of Science and Technology. The award was presented by the Honourable President of India Dr A P J Abdul Kalam

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**Modular Toilets for Indian Railways**

**Features and advantages:**

Factory built, prefabricated product, ‘ready to assemble' in A/C Coaches (manufactured by Integral Coach Factory, Chennai, Tamil Nadu, and Rail Coach Factory, Kaputhala, Punjab)

Many innovative ideas incorporated to suit cultural sentiments, enhance the aesthetics, convenience & safety.
Way ahead...... to take these R & D efforts to the next level

Support from funding agencies for making prototypes and market studies

Assistance in Identifying and connecting with Potential Users/ Entrepreneurs

Support to provide these technologies to the needy e.g. The artificial hand for those disabled in war, landmines and other prototypes developed for the physically challenged.

Publicity to the R & D efforts - to find entrepreneurs to take these efforts further

Incentives to the inventors

Policy intervention - e.g. Subsidies, Tax benefits
Concern for man and his destiny must always be the chief interest of all technical efforts. Never forget it in all your dreams and equations -- Albert Einstein

Thank You