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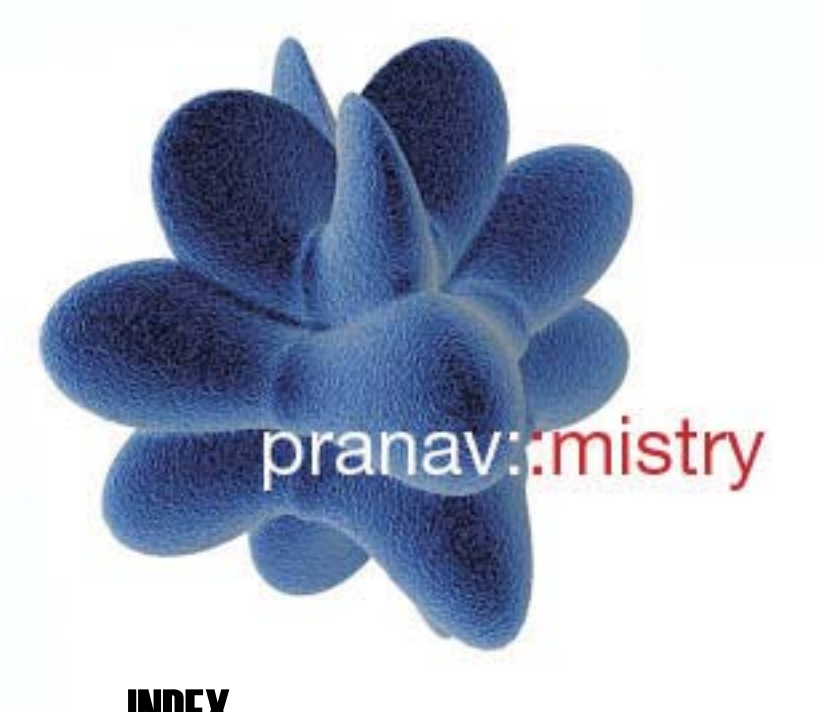
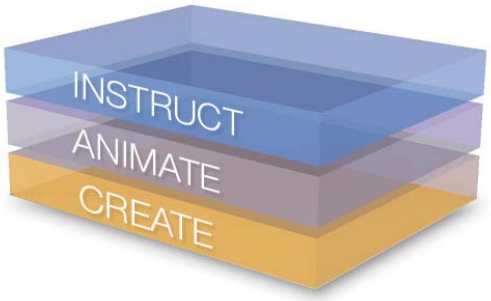


INDEX



invent
Imagine...Explore...&...Learn

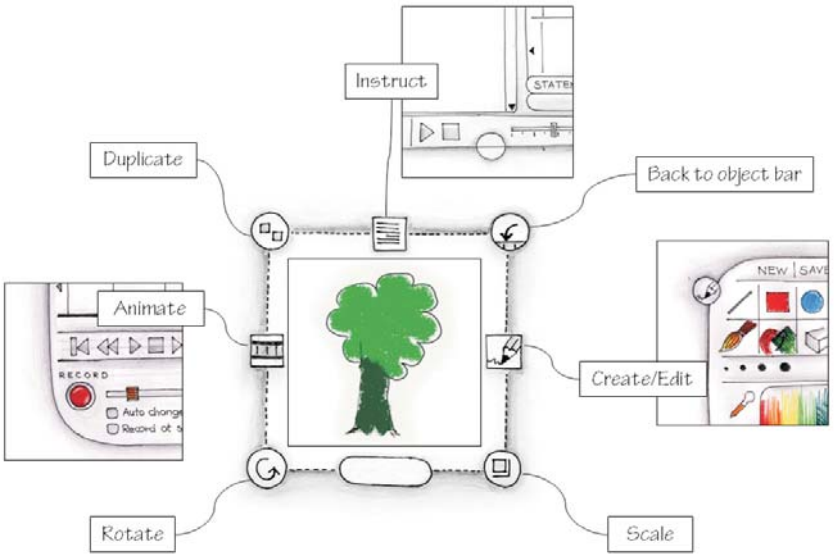
invent

design of a programming language for children

A conceptual gap exists between the representations that people use in their minds when thinking about a problem and the representations that Computers will accept when they are programmed. For most people learning programming, this gap is as wide as the Grand Canyon . invent is my research project under the guidance of Prof. Ravi Poovaiah initiated with the vision to help solve the same. I have taken children as my users.

The initial goal of invent is to design an intuitive programming environment for children. The key ideas are to use representations in the computer that are analogous to the real world objects being represented or letting children create them and to allow those representations to be directly manipulated in the process of programming. The child can create objects, give them properties and attributes & use those objects to create their world creating challenges & solutions to them. invent is an attempt to make programming more like thinking.

In brief, invent=‘Imagine...Explore...&...Learn'



DATAG2.02

An intuitive interaction

With the aim of providing a more intuitive and physical interaction with systems and machines, the project DATAG2.02 explores a new mode of human-machine interaction. DATAG2.02 consist an artificial gadget kept in the real world. The user will use this glove like gadget to interact with objects and perform the desired action in the virtual world. The user's actions are mapped by the gadget and the virtual world experiences the changes done by user as well.

The overall goal of the project was to explore the novel way to interact with virtual worlds and systems with inaccessibility, like a robo on moon or a crane hand lifting huge rocks. I won award at India level Open Hardware Contest for DATAG2.02. It is also awarded at Ingenium2002 for its innovative perspective.

marbo
share your marbles

MARBO

Share your marbles

My research project with Microsoft Research - MARBO, is the concept of a communication device for children helping them share their feelings, events and learning with fun. After a deep study & analysis of children's world, we came up with the product called MARBO. With the initial goal of making the social circle larger, building trust among children, making learning interesting & fun for them, MARBO has been extended to a level that, it is 'the' device for children.

MARBO is basically inspired by the metaphor of the marbles, a traditionally popular toy in India . MARBO is a device through which children can communicate with each other to freely express their feelings, as well as have fun by exchanging of ideas, emotions and having collaborative and interactive learning. With its spherical screen and detachable marbles (digital memories), MARBO provides a new mode of interaction. For its wonderful unique design concept and social aspects, MARBO is awarded 1st prize in Design Contest at Innovation Fair.

ProjectCHILD

Teach computer that 2+2=4

projectCHILD explores the very basic but interesting cognitive aspects of human mind, about learning and remembering that 2+2=4 or such similar concepts. The core initiative to the project is the thought that, there are some tasks which we human perform faster that these computers and robots. To make them do the same with the same efficiency we can try making them learn as we have learnt.

Through projectCHILD I tried to teach computers of my lab that 2+2=4, but by the way a child is taught by his teacher, mom or friends(sometimes 2+2=5 or 2+2=?). These children (machines) at the end of the project learnt that 2+2=4 as a child learn the same.

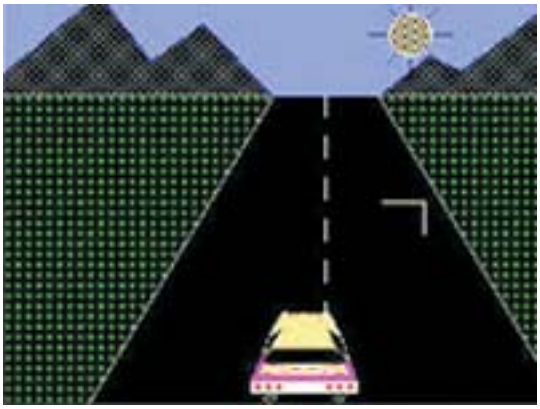
SunFlower

Lets track the sun

My interest in exploring nature led me to wonderful idea of having artificial sunflowers. With simple op-amp 741 circuitry & photo sensors I implemented a sunflower which could track the sun. Though later the concept was very efficiently used in solar panels at my institute as the panels could get the most efficient angle each time, at the core, there was my interest in designing electronic interactive experiences.

RoadRunner 2.01

a 3D car racing game

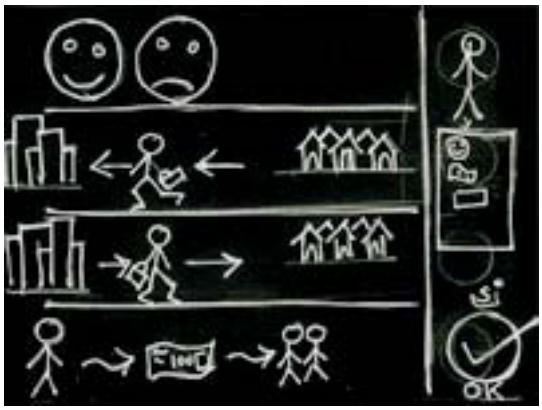


RoadRunner was one of my attempts to make computer games when I was in second year of computer engineering. The interesting feature of the project is that the game gives user a 3D game experience, though it is made by 2D graphics techniques. Study of human mind's perspective about 3D and algorithms to generate 3D look from simple 2D graphics primitives of C are at the core of the project.

Sandesh

connecting rural India

In the search of work, to earn their bread lots of people in India come to metros from their distant villages. Sandesh addresses the need of communication of such people. It is an attempt to connect their parents & relatives to them where no reliable or efficient modes of communication are available. Besides the illiteracy in reading and writing in standard languages like Hindi and English, inaccessibility of communication services like phone and mails creates the major problem of other end(village) connectivity. To help solve it Sandesh suggests a new system using existing PSTN network and simple interaction methods. Sandesh contains a message receiving unit at rural end and kiosks at metro end with visual aids. It uses of print/sound based medium to convey messages.



Ghost in the machine

"creative machines?"

"It is by logic we solve, but it is by intuition we create." Questioning the nature of creativity and experimenting with my desktop computer to create pieces of art ended with the discovery of a ghost in my machine. From studying drawings done by children to the robots playing chess and painting on canvas it is the result of an experimental formative approach. It is an attempt to answer some of the questions arose during my journey of enjoying children drawing mountains, sun and river and those happy moments of programming my desktop machine.

With a vision of questioning the nature of creativity the idea was to generate pieces of so called art or creativity in collaboration with machines. "Creative machines?"; "Can machines be creative?" My thoughts and attempts to explore the same, to seek in the field with a positive approach of making machines creative, which can generate pieces of so called 'art', are also documented as a paper titled 'ghost in the machine'. I think Life is 'Trying things to see if they work'.

VET

Visual aids to scheduling and decision making

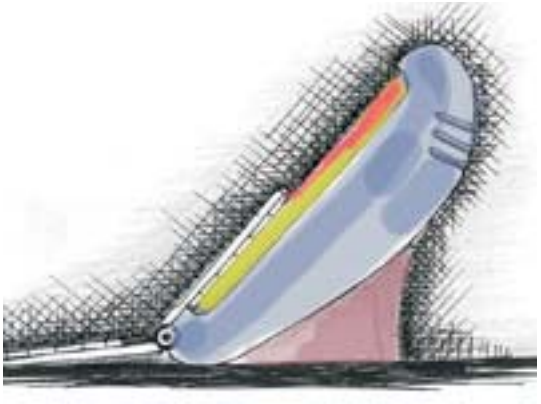
New technologies have created new opportunities to look forward the vision of 'Technology to Masses' from different perspectives. Not technology, technology in 'meaningful manner', only will help solve the current problems. Lack of proper scheduling, decision making support, planning and resource management seems the driving force for the inefficiency in veterinary services provided by Amul in Gujarat . The inefficiency in existing scheduling system ends in inefficient use of system resources and improper handling of emergencies.

With the proposal of a revised system based on decentralization of visit request registering and a map-based interface of VET for scheduling, the project aims to solve the problems to a level. With the help of a story based design approach throughout the project and evaluations at various stages helped define the efficacy of the suggested solution.

Sthiti

design of a local positioning system and services

I think Sthiti was my first project which help me broaden my perspective to look at technology. Now, in this age when we have enough of things to explore, it is not important that what we can do. Important is what we should do. Sthiti was an attempt to help people in finding things, people, places along with basic information they need. It is a system design of having a local positioning and information system in the small regions like university campus, hospital, shopping mall, multiplex theatre, etc. A small handheld device or user's mobile phone can be used as a medium to provide this location specific information or to help them finding their way. The project gave me an opportunity not only to explore networking, mobile technologies but also user interaction design.



VEDa

'A tool is not the task, and often the invisible, social, non-physical aspects of a technological regime make all the difference'. VEDa is a conceptual design of 'the' home device for Indian market. Deep understanding of need of common man of India led to the wonderful product VEDa during my summer internship at Microsoft. With the exploration of all possible aspects, not only technology, but also social aspects, market, people and their need, their likings, understanding ....all collectively acted as a good base on which I could come up with VEDa.

The project gave me a broad perspective to the digital industry as a good platform to have business and product research along with exploring hardware technologies, to form design.

अक्षर (Akshar)

A unique mechanism for inputting Indic scripts on digital devices

Data entry methods for Indian languages like Hindi, Gujarati and in general are not keyboard friendly and their entry using QWERTY keyboards is cumbersome and complicated, it involves the use of multiple shift modes. The same applies to the input methods on mobile phone and other interactive digital kiosk like systems. There is a great need for practical input mechanism/scheme specifically for various Indian languages.

With the vision of 'Innovate for India', Akshar is basically an attempt to have 'the' input mechanism for inputting Indic scripts in Digital devices like Mobile phones, Kiosk booths, WLLs, Interactive TVs, VEDa or Personal Computers. It is observed that most of the scripts in India have their base in Brahmi script. Akshar uses unique features of grouping of 5 consonants in such script. Study has shown that this new mechanism is far better than any other input methods available around today. The reason for that is, without any consideration of features of Indic scripts, these methods are taken as they were from Latin based script mechanisms.

Papers and Seminars

Perceptual User Interfaces: an inspiration from Indian traditions

My detailed study and research interest in PUI and multimodal interfaces resulted in a seminar as well as a paper I presented. The core interest was to get inspirations from reach Indian traditions and use this extensive knowledge to design more intuitive, natural and physical interactions.

Functional Metaphoric Approach to be in the flow with interfaces

Mihaly Csikszentmihaly's concept of 'flow' and an inner urge to use 'the way we use things' as metaphors resulted in my recent research work on Functional Metaphoric Approach. Through the paper I suggested FMA as a heuristic in developing user interfaces with better user flow. The paper has been selected as one of the best research work and published in IHCI2004 under new trends in HCI session.

Microcontrollers - ‘controlling machines’

How to use Microcontroller to control the joined pieces of metals most effectively was one of my main interests during engineering studies. Though, the seminar, basically introduced the world of microcontroller and its programming to the novices to the topic, ideas about wonderful uses of microcontroller imagined and presented in the seminar made it an interesting talk for all there.

Computer Vision - an informal approach

The automatic deduction of structure & properties of the possibly dynamic three-dimensional world from either a single or multiple two-dimensional images of the world can be used as a strategy to design robotic systems where we need machines with vision. My study in the field, exploring the logical and implementation concerns about the same is resulted in a seminar titled 'computer vision'.

HMD and Visual Ergonomics

As a part of my course in visual ergonomics, I worked on how visual ergonomics and related concerns help design Head Mounted displays to be used in virtual or augmented reality worlds. At the end of the course I presented the findings in a form of a paper and a seminar.

SOROTICS

social + robotics = sorotics

Designing robots with social skills and understanding is a critical step towards enabling them to cooperate with human as capable partners, to communicate with human intuitively, and to learn quickly and effectively from natural human instruction. These abilities would enable many new and exciting applications for robots that require them to play a long-term, supportive, and helpful role in humans' daily lives.

sorotics group aims research in human-robot interaction leading towards building sociable autonomous robots that can work in collaboration with people.

HCI India

HCI India is basically an activity group initiated by me to have a nonformal ground to discuss the thoughts, problems, challenges and learning in the field of Human Computer Interaction. People from various background like computer science, architecture, design, … are member of the group. This kind of variety in members from students to professionals provides larger perspective to the discussions at the group.

HCI India

zombie.labs

zombie::labs

zombie::labs is an initiative started by me in 1999, aiming to have research in the field of interactive intelligent systems. I have conducted various research projects under the name of zombie::labs. It is my dream to make systems in true sense 'humane' through research going on at zombie::labs. Projects related to various fields from artificial intelligence to interaction design and from robotics to HCI make it an interesting body working with a focused goal towards developing interactive intelligent systems.

Designing Intelligence

Designing Intelligence

Designing Intelligence is a research initiative with the vision of thinking technology from design perspective and vise versa. My research interest in artificial intelligence, social computing, robotics ended in this two strange sounding words.

The core idea is to design intelligent interactive systems. The idea is.... . . Yes, to think that only that what can be or should be in this future(present) which is full of intelligent systems around us. The idea is to design it.I agree with Alan Kay that 'The best way to predict the future is to invent it'.

Staying in the FLOW

It has been found that while using a computer, human sense that they are performing a task. I think still computer interfaces do not keep user ‘staying in the flow' fully while working. At the same time in real life results are somewhat ironical. Mihaly Csikszentmihalyi has explored the characteristics for perceiving optimal experiences, with the issue of ‘flow'. People in a state of 'flow' are those who feel that they are engaged in a creative unfolding of something interesting; athletes call it ‘being in the zone', mystics have described as ‘ecstasy', and artists ‘rapture'. You and I may recognize our flow experiences as simply those activities (work, a hobby, some kind of service) which seem to make time stand still. The core idea of the research is to design interactions with machines, computers that we feel ‘staying in the flow'. As a part of the research I presented my paper titled ‘Functional metaphoric approach to be in the flow with software interfaces' at IHCI2004, Bangalore.

staying in the flow

Awards and Achievements

. 2nd in SPACE competition in SIGGRAPH2004.
. 1st in Innovation Fair at India level, for project MARBO.
. All India 3rd in National Open Hardware Contest at IIT Bombay for project DATAG2.02
. 3rd in Model Presentation at INGENIUM 2002.
. 3rd in Creative art competition organized by ISRO.
. 1st in Design competition organized by IEEE, India chapter.
. 2nd in website designing organized by ACES.
. Selected for the prestigious DIRUBHAI AMBANI FOUNDATION AWARD for securing 1st rank in district.
. 2nd in on the spot Model Making contest at techfest2001 at IIT Bombay.

Academics

Exam	Year	University/Board	Grades	Class (Rank)
M.Des				
4th semester	2005	IIT Bombay	10/10	I-Dist (1st in IIT)
3rd semester	2004	IIT Bombay	8.82/10	I-Dist (4th in IIT)
2nd semester	2004	IIT Bombay	9.49/10	I-Dist (1st in IIT)
1st semester	2003	IIT Bombay	9.24/10	I-Dist (1st in IIT)
B.E.				
8th semester	2003	Gujarat Uni.	78.46 %	I-Dist
7th semester	2002	Gujarat Uni.	77.87 %	I-Dist (6th in uni.)
6th semester	2002	Gujarat Uni.	73.65 %	I-Dist (5th in uni.)
5th semester	2001	Gujarat Uni.	75.50 %	I-Dist (8th in uni.)
4th semester	2001	Gujarat Uni.	75.72 %	I-Dist (7th in inst.)
3rd semester	2000	Gujarat Uni.	65.57 %	First
1st year	2000	Gujarat Uni.	68.14 %	I-Dist
School Board				
H.S.C.	1999	G.S.E.B.	81.00 %	I-Dist
S.S.C.	1997	G.S.E.B.	91.57 %	I-Dist (1st in district)

Extra Curricular

Former coordinator of Association of Computer Engineering Students (ACES).
President of Young Scientist Club (YSC), Palanpur branch.
Table Tennis- district Champion for 7 years, Institute champion for 3 years.
Founder and Incharge of zombie::labs, a research group.
Founder of the sorotics (social robotics) group in IIT Bombay
Lead coordinator of HCI India, an informal community of HCI in India.

Areas of Interests

Social Computing, HCI, Interaction Design, Robotics, New media, Cognitive Science, Virtual Reality, Visual Reality, Machine Learning, Artificial Intelligence, Intelligent Interactive Systems and Environments.

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Social Computing

Human Computer Interaction

Robotics

Artificial Intelligence

Intelligent Interactive Systems/Environments

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