



**I'm Athul Dinesh,
and I teach at the National Institute of Design, R & D
campus in Bengaluru in the Universal Design Discipline of
the Industrial Design Department.**

**I also work as a Design Consultant for projects of Service
Design, Industrial Design and Design Research.**

**I partner with the artisans of Traditional Indian
Handicrafts to make contemporary products.**

**My design focus is on Ergonomics, Design Thinking,
Design for Elderly, Disabled and Children, Toy Design and
Design Management.**

**My research focus is on Inclusivity through Design and
Design for Play.**

CONTACT

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ACADEMIC PROJECTS

Paletteballet

Children play with things all the time. What if this play can be transformed into a beautiful painting? This is what Paletteballet does. It is a tool that allows children to let out their inner artist.



BRIEF AND IMPACT

Paletteballet was started as a project to improve the way in which children make their artwork. A workshop was conducted to understand how they paint. The activity was closely observed and recorded. Thoughts were put into improving this experience into a better one and Paletteballet was born. The skill of traditional Channapatna artisans was an essential part of this project. The project won the merit award In January 2019 for the best Industrial Design at Tokyo, Japan in a competition held by Kokuyo International. The product was chosen from around 1289 world-wide entries.

YEAR

2018

DISCIPLINE

Industrial Design
Craft Design
Accessible Design

SECTOR

Toy
Consumer goods
Stationary

COLLABORATORS

Bharat Arts and Crafts, Channapatna
Pranav Bidwe (Content creation)
Ghufran Ahmed (Title and Video creation)



PALETTEBALLET

A free- form painting kit which nurtures creativity in children through play.

<https://www.kokuyo.com/en/award/archive/prizepast/2018.html>



#1 WORKSHOP
To understand how children paint.



#2 FINDINGS
Children enjoyed the process of painting.



#7 COLOUR STORAGE
Containers inspired from elements of Nature.



#8 MIXING
Shake to drop the colour pigment.



#3 IDEA MAPPING
How to make a painting kit.



#4 IDEATION
Words to sketches.



#9 TESTING
A girl mixing the colour.



#10 SPINNER
A girl using the spinner to paint.



#5 FINAL PRODUCT FORMS
Dimensional drawing of the product.



#6 MANUFACTURE
With traditional toy making technique.



#11 INTERNATIONAL APPRECIATION.
The project won the Kokuyo Design Award.



#12 INTERNATIONAL WORKSHOPS.
Children at an exhibition in Malaysia.

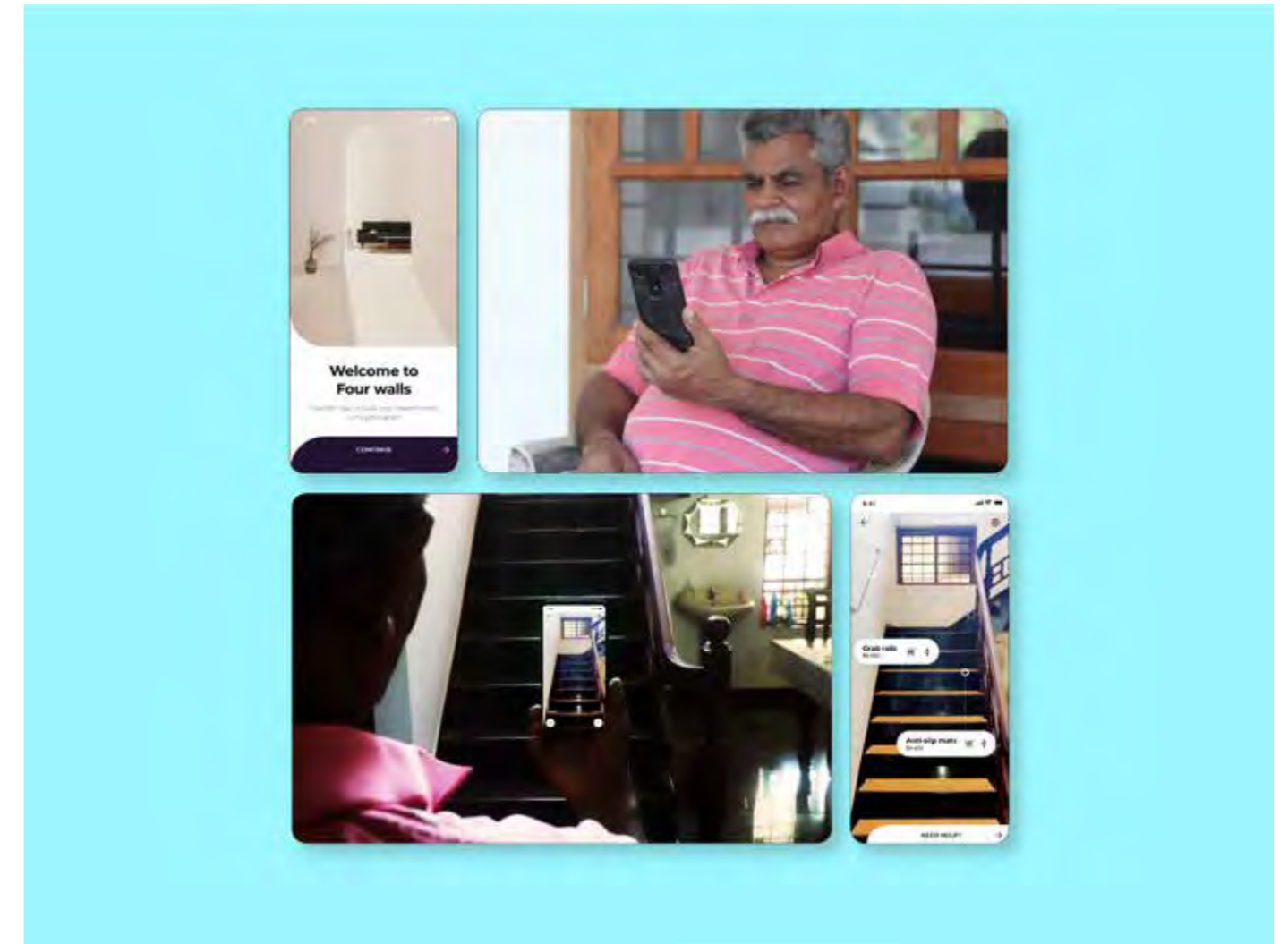
Four Walls

How might we harness age-friendly design to 'future-proof' homes so they are sustainable, safe and inclusive places to live and enjoy?

BRIEF

In India only three percent of buildings are accessible according to the Department of Empowerment of People with Disabilities (DEPwD). This is despite a significant number of people with physical disabilities and a population of over-60's expected to increase from 8 to 20 percent by 2050. Four Walls is a platform and service design concept which helps users to learn about accessibility upgrades and products that can be applied to their homes. The platform provides advice and solutions while also showcasing existing ready-made products on the market. A small network of local experts and labourers is also available to consult with and source for bespoke products..

RSA Student Design Awards
Winner 2021



FOUR WALLS

A design solution to solve the accessibility issues of homes across the globe.

YEAR

2021

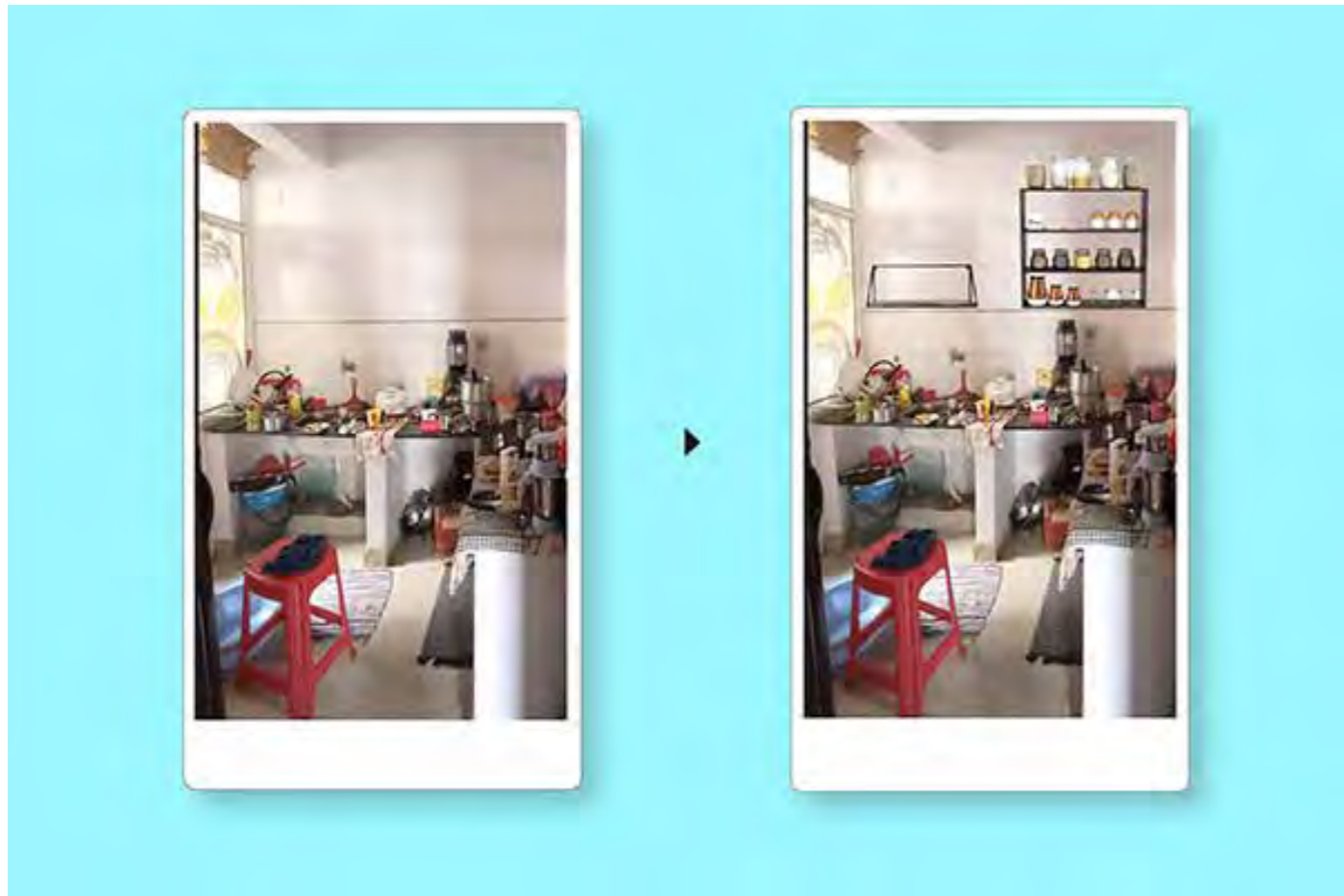
DISCIPLINE

Human-Centered Design
Accessible Design
UI/UX Design

SECTOR

Service Design

<https://www.thersa.org/student-design-awards/winners/2020-21/home-sweet-home>



#1 FOUR WALLS APPLICATION

The app searches for accessibility issues in the house and suggests bespoke solutions.



#2 FOUR WALLS SYSTEM DESIGN

The diagram of the product-service-system.



#3 STUDENT DESIGN AWARDS

Newspaper cutting from dailies on winning the awards, June 2021.



#4 WINNERS ONLINE CEREMONY

The ceremony was held online due to the COVID-19, pandemic.



#5 THE TROPHY

The Royal Society of Arts, Student Design Awards, Pebble.

Tree of life

We are all part of a whole. A family, a neighbourhood, a state, a province, a country or a planet. But what holds us together? It is a heritage. But how can we make people understand the importance of heritage? Through interactive storytelling.

BRIEF

The tree of life structure and 'jaalis', seen at various parts of Ahmedabad was the inspiration for our installation. It represents a tree that provides good health and wealth eternally to the people. Here, in our installation we put in both the traditional and the modern ways of design and fabrication. In the interactive installation, there is a lifeless tree to which the visitors are ushered to connect the leaves, and give life to it. The tree represents the culture of Ahmedabad. The people and architecture give life to it. The gesture of picking up the leaf with photographs of the people and architecture of Ahmedabad, and connecting the leaf to the tree represents giving life to an inert object.

YEAR

2018

DISCIPLINE

New Media Design
Universal Design

SECTOR

Manufacturing
Narrative Installation

COLLABORATORS

Evy Design Studio, Paris
Ravi Deepres, Birmingham City University
International Open Elective, NID Paldi
Ananth Krishnan, Igin Shaji, Namita Verma,
Ronit Pandya, Suhas Sourav



LEAVES OF HERITAGE

The leaves containing the essence of the heritage of Ahmedabad, scattered on the floor.



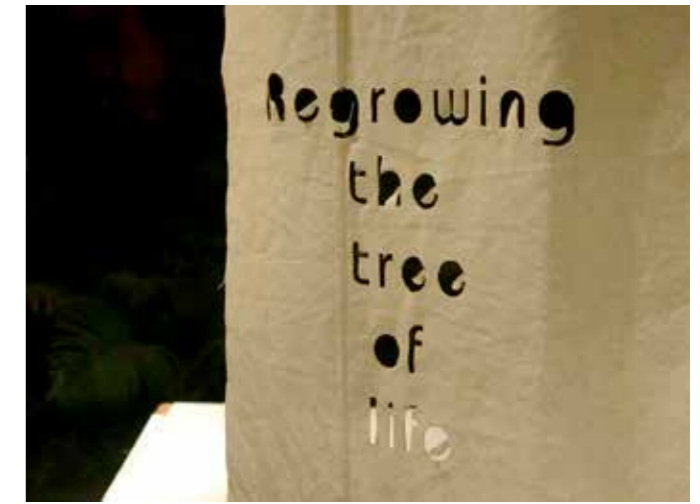
#1 FIELD STUDY
The crowded market in old Ahmedabad.



#2 FIELD STUDY
Two boys in Sunday market.



#7 PAINTING
The elements were spray painted.



#8 PROPS AND DISPLAY
Hangings were made from cloth.



#3 SKETCH
A very rough sketch of the installation.



#4 MAKING THE TREE FRAME
The tree was made with wires of different gauge.



#9 EXHIBITION
Initially all the leaves were on the floor.



#10 THE GROWTH OF THE TREE
People started connecting the leaves to the tree.



#5 LEAVES
The leaves were laser cut from photographs.



#6 FLOWER
Some elements were made by 3D printing.



#11 MORE LEAVES.
In the end all the leaves were tied on to the tree.



#12 THE END.
At the end of the day the tree was in 'alive'.

CLIENT PROJECTS

Design of Playthings

I started designing for children as an independent practice after my graduation. I created playthings for many international clients. Most of the designs were manufactured out of wood and sustainable materials. The world of Play has attracted me so much because it is challenging and satisfying. I focus on the co-creation of toys with the children. I exhibited my toys at Spring fair 2022 in Birmingham, UK and Kuala Lumpur, Malaysia.

YEAR

Since 2020

DISCIPLINE

Design for Play
Industrial Design

SECTOR

Toy and Game

COLLABORATORS

Fusion De Nova, Chennai.
Bharat Art and Craft.
Midhun Muraly.



TOY DESIGN

Discussion with co- designer.



#1 SPINNING TOP
Plain wood spinning top.



#2 SPINNING TOP
Lacquer finished spinning top.



#7 FIDGET TOYS
Fidget toy prototypes made in Channapatna.



#3 DOLL
Lacquer finished doll.



#4 FARMERS
Abstract farmer models created by artisans.



#5 DARTH WADER
Star wars characters made by artisans.



#6 CHICKEN
Lacquer finished dolls.



#8 SPINNING TOP
Spinning top made in red and orange lacquer.

Bharat Art and Crafts

COMPANY PROFILE

The company has its roots all the way back in 1700, when its primary function was the manufacture of wooden dipping pens. At present Mr. P Mohamed Ilyas carries on the legacy with his sons. This company and its innovations have been part of people's lives for 5 generations and is continuing to move forward. One of our newest developments is the inauguration of a new unit in the Channapatna Craft Village.

BRIEF

The company with such long tradition and legacy wanted a new brand identity to match with the modern world. I created a new logo, brand guidelines and a new website for Bharat Art and Crafts.

YEAR

2022

DISCIPLINE

Brand Identity
UI/UX Design

SECTOR

Social Work
Craft

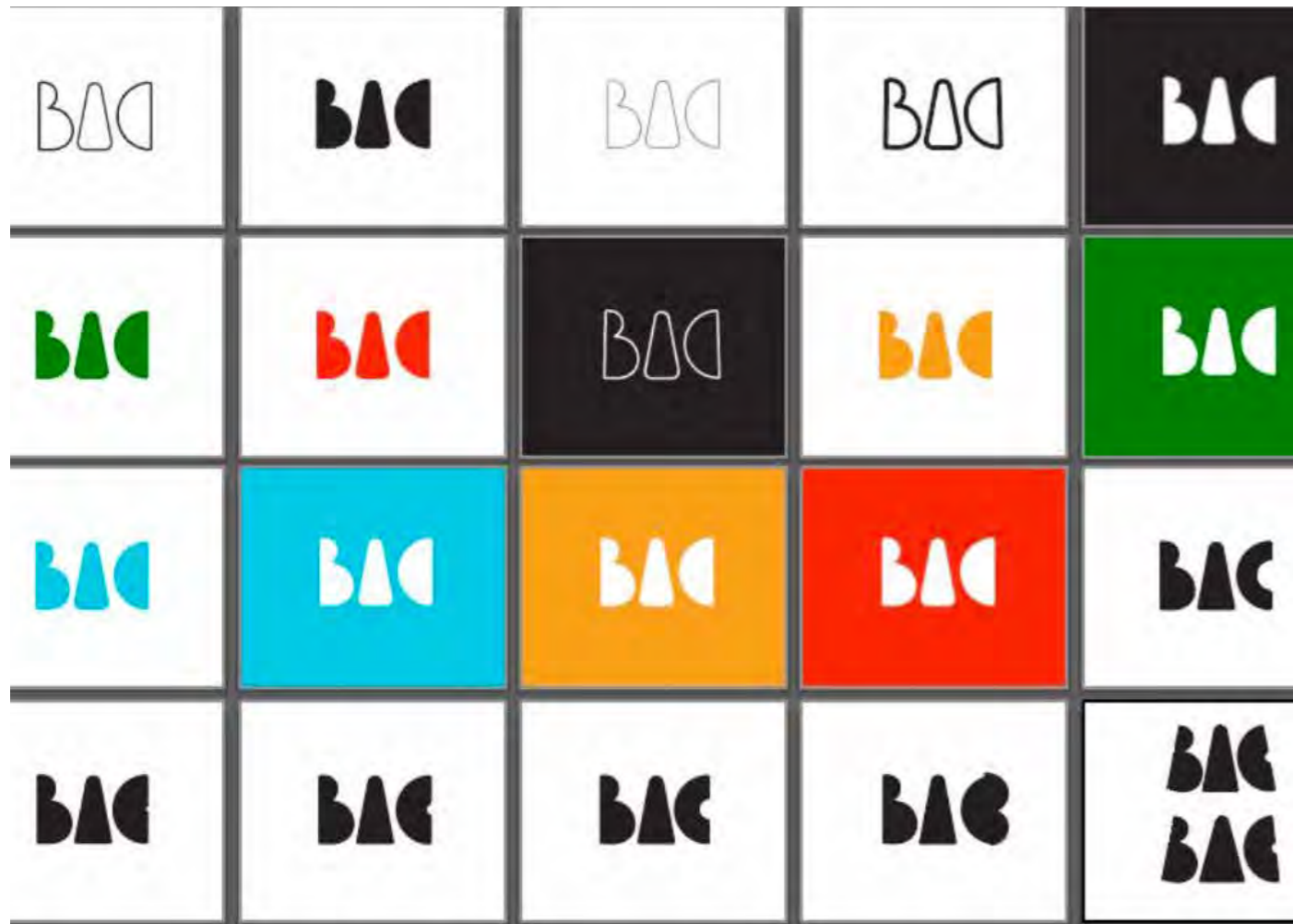
COLLABORATORS

Farhan Ibnee Abid
Roshan Rajendrababu



BAC Brochure

The brochure was made for the publicity of the brand.



#1 LOGO ITERATIONS

Logo designs were inspired by Channapatna manufacturing process.



#3 PRINTED LOGO

Logo printed on the packaging.



#2 LOGO ON A TOY

New logo etched on a toy .



#4 BAC WEBSITE

Newly designed website of Bharat Art and Crafts.

Yarnit

COMPANY PROFILE

Yarnit is an early-stage start-up with a SaaS product, in the space of digital storytelling.

At Yarnit, the goal is to reduce the time, cost, and complexity of digital storytelling, with an AI based intelligent guided service, which leverages best practices from storytelling and multi-media communication.

BRIEF

The company wanted a service design blueprint for their platform that would help in content creation and multi-media communication. My team and I developed the design over a span of one year.

YEAR

2020 - 2021

DISCIPLINE

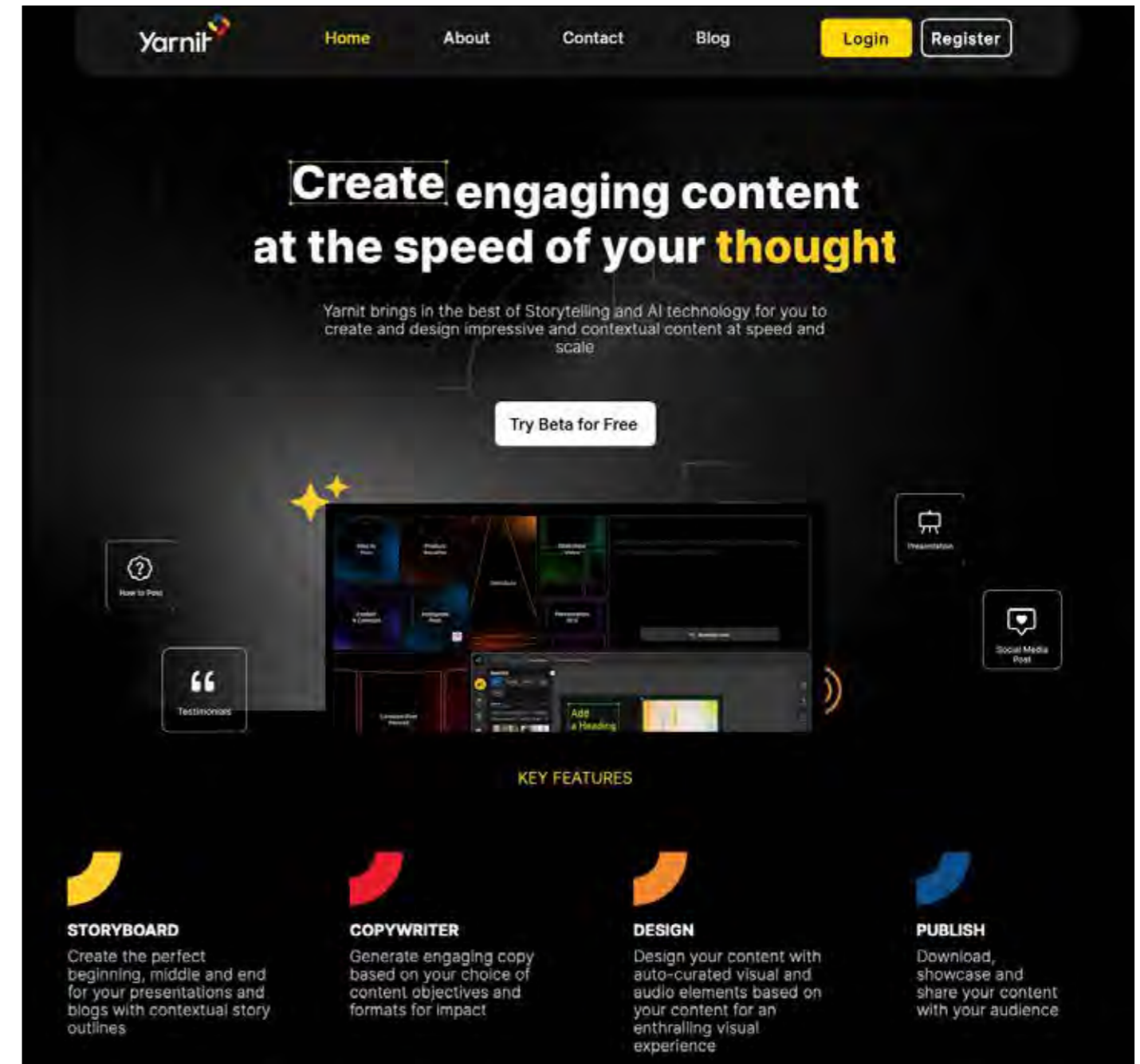
Service Design
UI/UX Design

SECTOR

Service Platform
Content creation

COLLABORATORS

Akanksha Bhatt
Roshan Rajendrababu
Jyotirmoy Dutta
Yarnit app

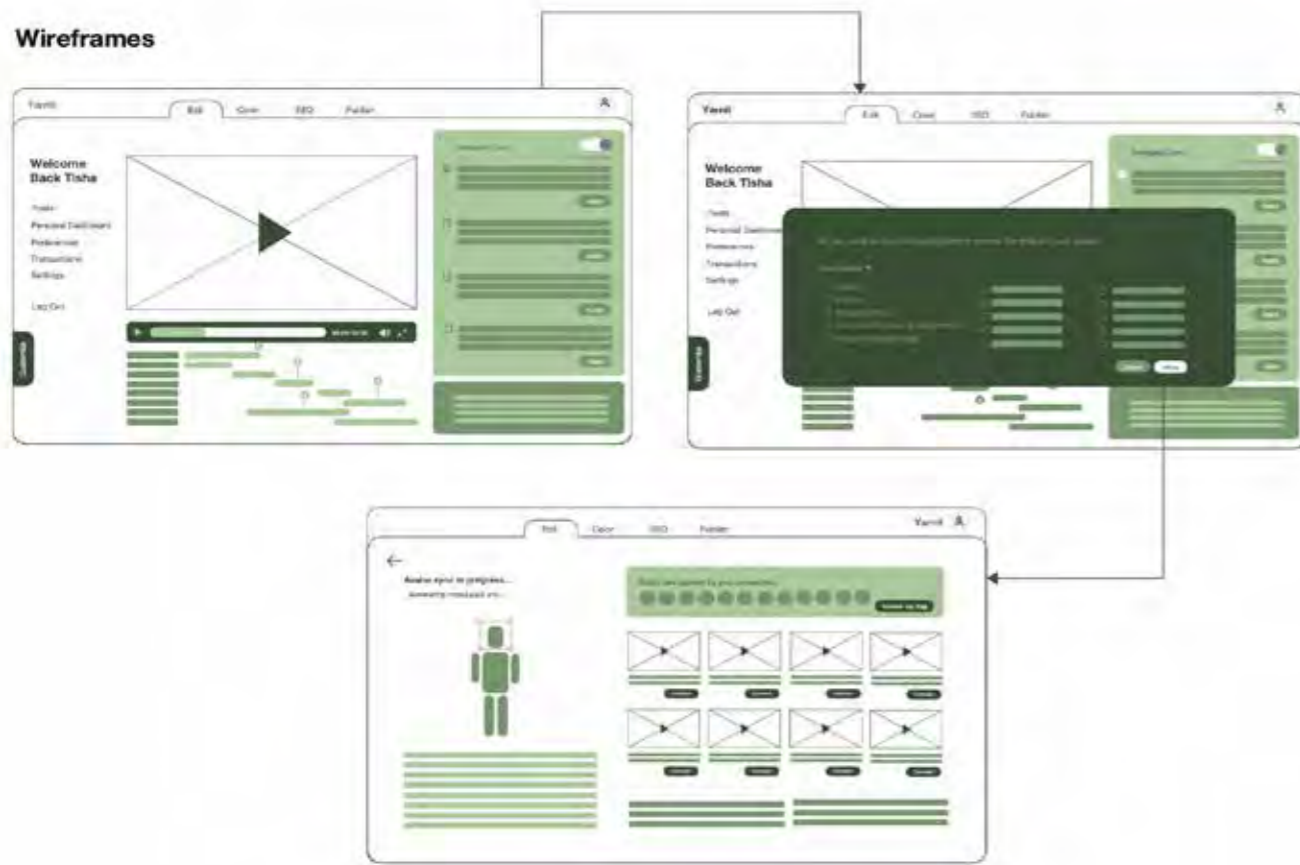


Yarnit website

The newly launched Yarnit Beta Website.

<https://www.yarnit.app>

Wireframes



#1 UI

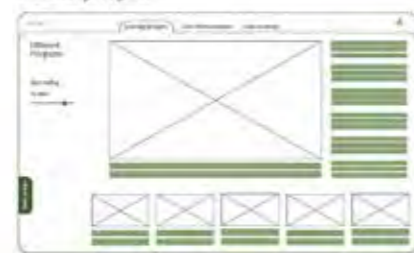
Design of Low fidelity wire frames for Yarnit app.

1. Choices to learn



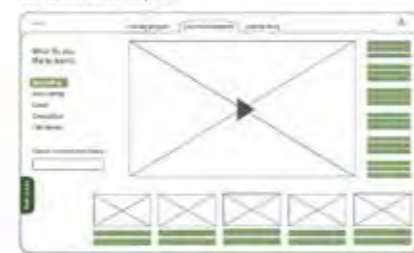
When the user choose to learn their yarnit, the user will be provided with these options.

2. Learning Program



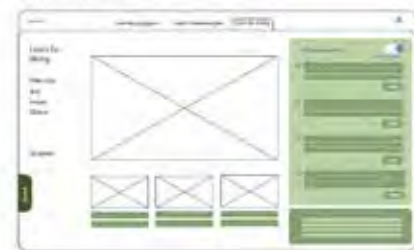
In Learning program, the user can choose to learn from different programs embedded over time. The user can also choose to learn from a specific course.

3. Learn from Examples



If Learn from Examples, the user can get to choose a content from the list and then can learn the program. The user can also choose to learn from a specific content.

4. Learn by doing



The user can learn by doing (learning a program) with or without the help of Yarnit and learn from it.

5. Yarnit in Action!



If the user chooses the assistance of Yarnit, Yarnit will guide the user in each step with examples and stories.

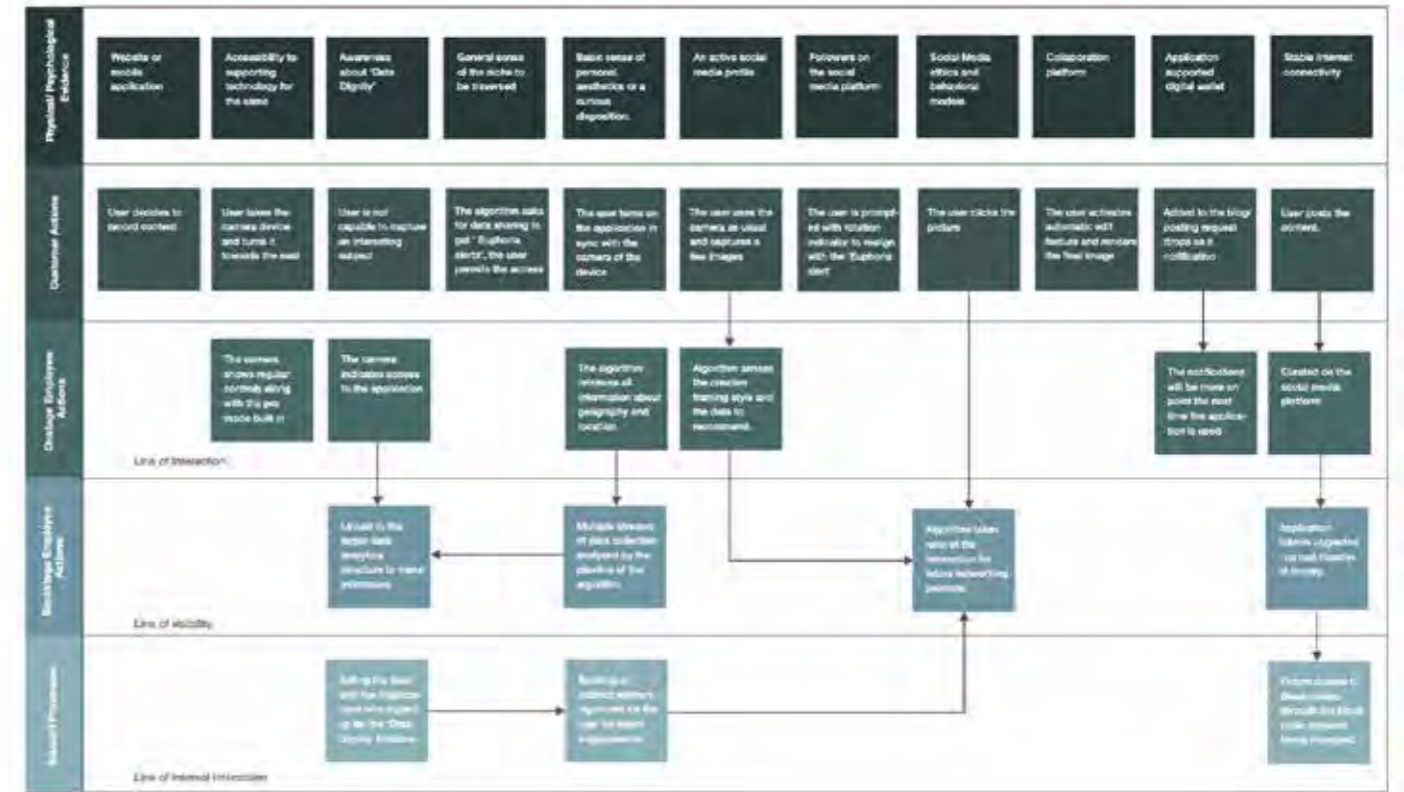
6. Refine and Export



Once the final output is learned, the user can get to see a detailed overview of the data based on the chosen content.

#2 UX

Design of User Journey in Yarnit app.



#3 SERVICE DESIGN BLUEPRINT

Detailed service design blueprint of Yarnit App.

Design Management

COMPANY PROFILE

MIPL Global is a global design company working towards "Connecting brand environment to workplaces". MIPL has established a reputation as a versatile integrator combining ideas, design, innovation in materials, and forethought in planning with nonpareil execution effectiveness. We have delivered to top industry segments such as corporate work spaces, hospitality spaces, healthcare environments, educational campuses, transportation systems & transit hubs, sports complexes, recreational arenas and residential communities.

ROLE

I was inducted to the design team to set up a proper design process and channelize the process for the benefit of the company and client. Initially, I had to observe all the events; from acquiring a client to delivering the required products. At the end of the contract I had the experience of working with several clients under a corporate setup.

YEAR

2019

DISCIPLINE

Space Design
Graphic Design

SECTOR

Environmental Graphic Design
Signages and Wayfinding

CLIENTS

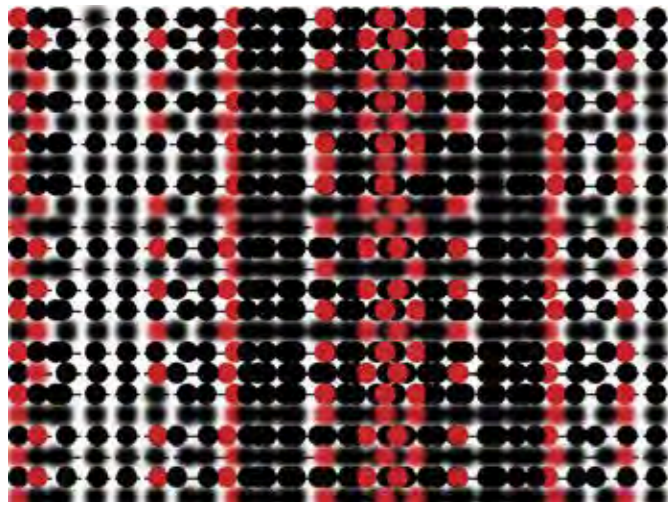


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QUICK BOOK

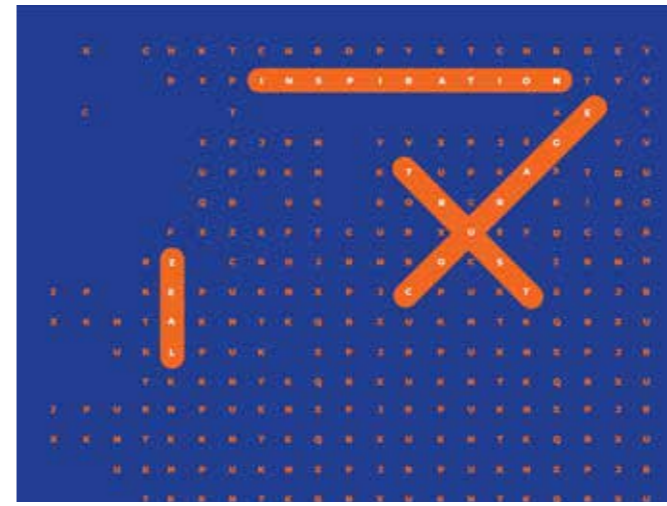
A design guide custom- made for the employees of MIPL Global.



#1 ABACUS
Vinyl print design idea for Standard Chartered.



#2 CHEMICAL REVOLUTION
Vinyl print design idea for Eastman.



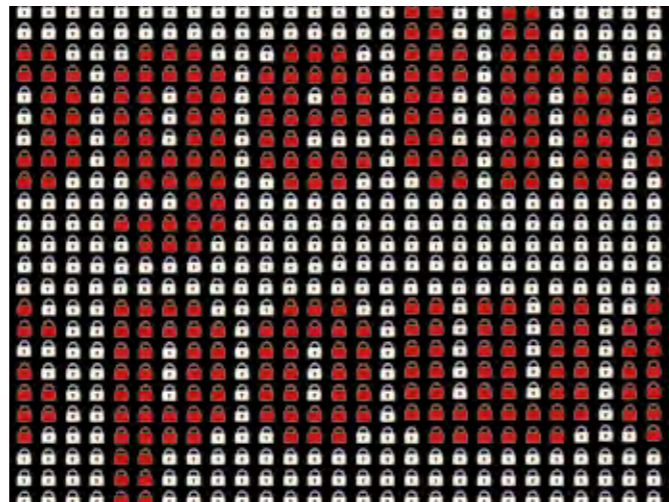
#7 CROSSWORD
Vinyl print design idea for Solv.



#8 TECHNOLOGY
Illuminated wall design idea for Northern Trust.



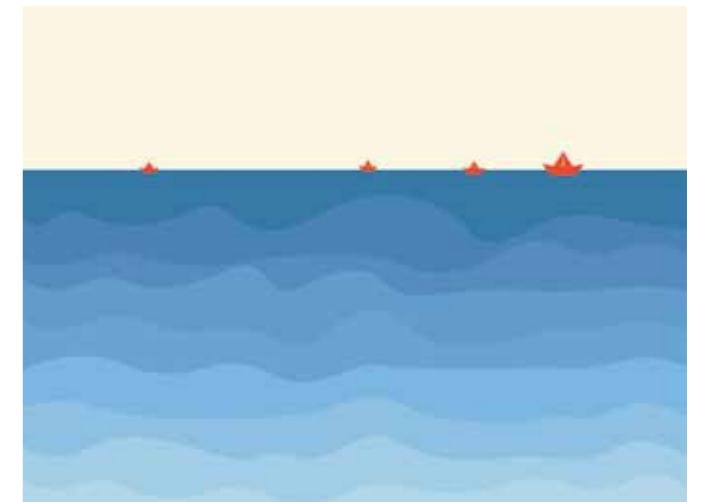
#3 RUGBY INFOGRAPHIC
Wall installation plan for Societe Generale.



#4 TOGETHER IS POWER
Wall installation plan for McAfee.



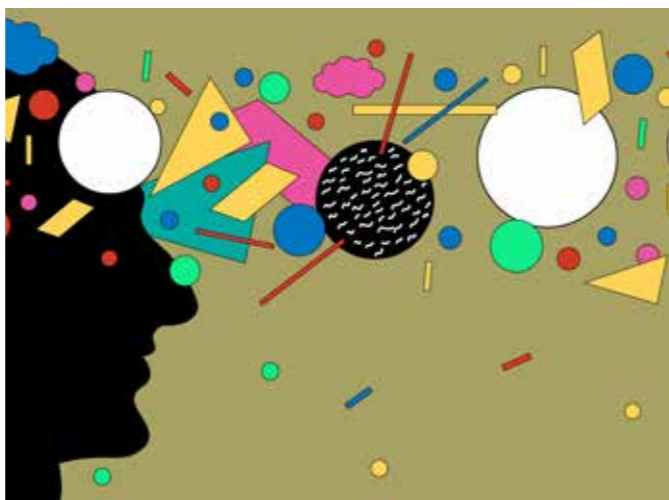
#9 WORLI
Worli art inspired vinyl print design for Globant.



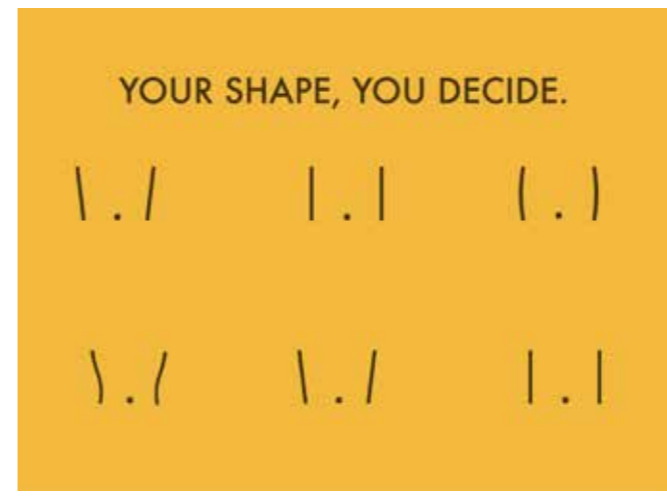
#10 PAPERBOATS
Vinyl print design idea for Standard Chartered.



#5 LET US COLLABORATE
Writeable wall design idea for Rubrik.



#6 THINK IN SHAPES
Writeable wall design idea for VMware.



#11 MOTIVATION
Gym wall vinyl print design for Societe Generale.



#12 SHAPES
Wall frosting design idea for Northern Trust.

Brand assets design

COMPANY PROFILE

STOKR is a digital marketplace built on the blockchain to create independent access to a new age of capital markets. Through programmable digital shares (transferable securities) offerings compliant with EU capital market rules, everyday investors can directly fund forward-thinking start-ups and SMEs in return for a share of the ventures' future profits or revenues.

BRIEF

The company wanted a special logo for the 2019 Christmas season. Several Christmas cups were also created with its logo. All the employees got custom made cups with their names on it. Another brief was to create a flyer for Dubai international expo. Two types of flyers were created for investors and ventures. The flyers had different design characteristics as per the brand guidelines.

YEAR

2020 - 2021

DISCIPLINE

Graphic Design
Product Design

SECTOR

Brand Assets Design

STOKR



COFFEE CUP PRINT GRAPHIC

The print design as per brand guidelines.



#2 VISUALISATION

The cup in an office environment.



#3 SPECIAL CHRISTMAS BRANDING

The cup with the special logo on it.



#5 SPECIAL LOGO

Logo designed for Stokr, Luxembourg during Christmas 2019.



#4 ORIGINAL LOGOS

The original Stokr logos created by AKQA Amsterdam.



#6 FLYER DESIGN

The flyer for ventures.



#7 FLYER DESIGN

The flyer for investors.

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For the love of Nature

The right to a safe, healthy and ecologically-balanced environment as a human right in itself, but entails the duty to protection. Accordingly, existing environmental laws set out that everyone must contribute to living in an environment adequate to his or her health and well-being.

BRIEF

A new park was built to improve the tourism at certain areas of Sirsi forest range. There were several rocks to be beautified by painting on them. All the concepts were based on the concept of protecting the environment for the sake of human beings and animals. All the paintings were concept based. "Girl and Tiger", "Ant hill", "Southern Bird Wing butterfly" and "Psychedelic ant" were the subjects. The "Southern Bird Wing butterfly" painting was done in the butterfly park. Most of the paintings were done with enamel paint and brush. Quick realistic touches were done with spray paint. The project took a week to complete. It was a wonderful experience at the forest in the midst of Nature itself.

YEAR

2020

DISCIPLINE

Wall Painting and Design.

SECTOR

Social Work
Applied Art

COLLABORATORS

Ashish Kumar
Midhun Muraly
Pranav Kishore Bidwe



GIRL AND TIGER

The 10 x 2 metre, mural done on a natural rock in Sirsi forest.



#1 SOUTHERN BIRD WING
The state butterfly of Karnataka in the park.



#2 ANT HILL
A narrative painting of an anthill.



#3 PSYCHEDELIC ANT
An ant shaped rock before painting.



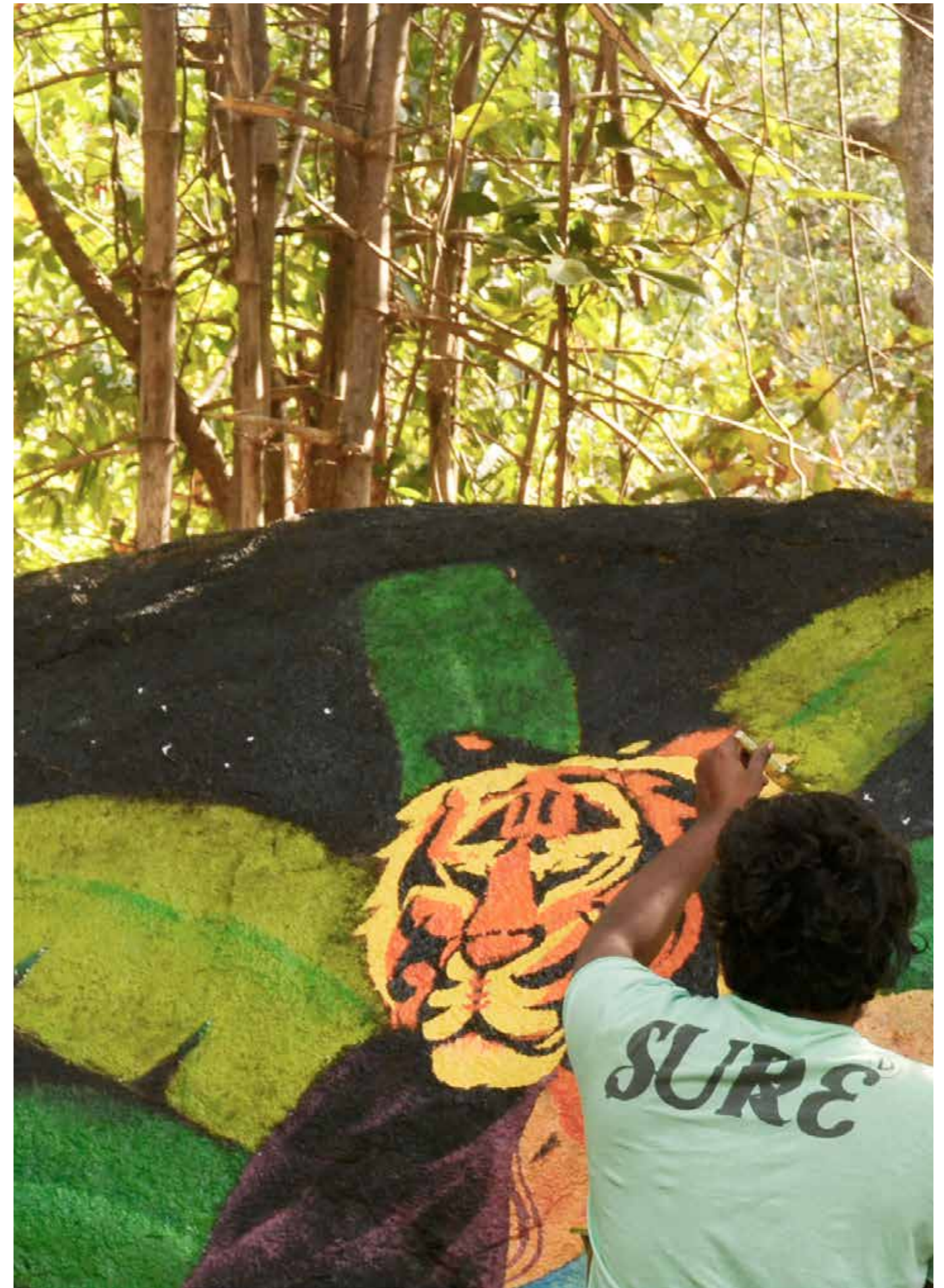
#4 PSYCHEDELIC ANT
After painting with sprays.



#5 ANTS
An area in the children's park for ant stories.



#6 GIRL AND TIGER
The painting that portrays love for Nature.



#7 FINAL TOUCHES
Adding stars to the night sky.

TEACHING & RESEARCH

Subject

DESIGN PROCESS

Design process is a course for the first year Master of Design students of all disciplines at the National Institute of Design, India.

Relevance

This course gives students an overview of the process of design which is essential for them to appreciate the learning through various courses.

Objective

To introduce students to the different stages in the design process – from perception of a problem to generating a solution to the problem through investigation, analysis and synthesis. To understand the methodology of the problem solving process.

Course Contents

- Analysis and mapping of the design process.
- The morphology of the problem solving process.
- Role of creativity in design.
- Methodologies and strategies related to the different stages of the design problem.
- Case studies.

Methodology

Lectures.
Assignments.
Individual design projects.
Discussions and feedback.

YEAR

2022

FOR THE M.DES STUDENTS OF

Industrial Design
Interaction Design
Information Design
Digital Game Design
Design for Retail Experience

INSTITUTE

National Institute of Design

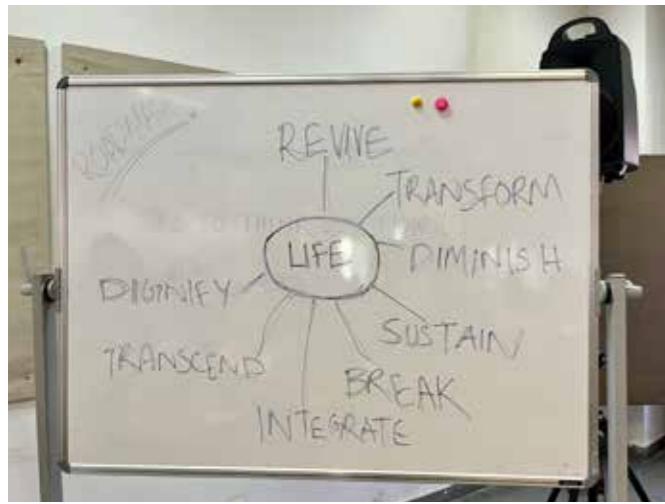
CO- TEACHERS

Nijoo Dubey
Tulip Sinha Neel
Balaji Rengarajan



DESIGN PROCESS LECTURE

A session where different types of design processes were introduced to the students.



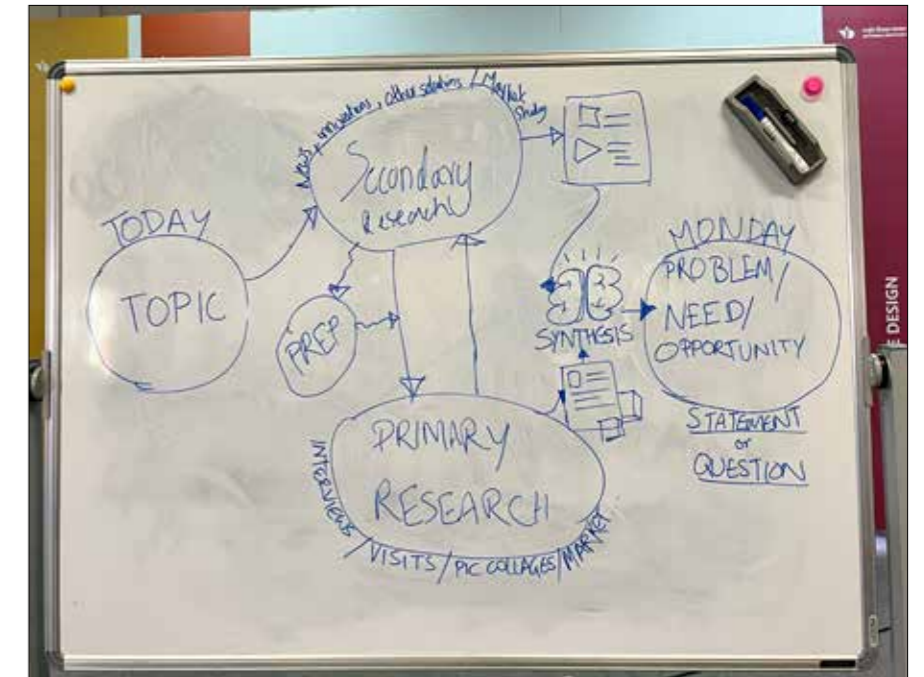
#1 TOPICS
Broad topics for students to start thinking.



#2 BRAINSTORM
Keywords and their interconnection.



#7 ANALYSIS AND SYNTHESIS
Problem statement and brief



#8 DIFFERENT STAGES
Different stages in design process



#3 ACTIVITY MAPPING
Students presenting their activity mapping.



#4 GROUP WORK
Students working in groups.



#5 AFFINITY MAPPING
Sorting keywords



#6 SORTING
Students sorting the keywords.



#9 CONCEPT PRESENTATION
Students presenting their concepts.

Subject

UNIVERSAL DESIGN THINKING

Universal Design Thinking is a course for the first year Master of Design students of Universal Design Discipline at the National Institute of Design, India.

Relevance

Universal design is a philosophy, a way of thinking at an intellectual level and at an actionable level an integral part of design process in achieving 'Good Design'. It is the shift in thinking of designing 'for us all' rather than 'for them'. It is design for Future, it is design for Diversity.

Objective

To introduce the concept of the universal design, Global and India view, the thinking, approaches, the concepts, policies and advocacies. To familiarize students to the 5 UD India Principles and the 7 Universal design principles. To sensitize the students to issues faced by intragenerational users and people with disabilities and identify areas of impactful design interventions.

Course Contents

- Discourses and Discussion on concept of Universal Design
- Case Studies in UD & models
- Mapping broad areas of need & impact for UD intervention
- Field Visits

Methodology

Discourses, Discussions & Discovery
Group exercises & collaborative study
Field study

YEAR

2022

FOR THE M.DES STUDENTS OF

Universal Design

INSTITUTE

National Institute of Design

CO- TEACHER

Nijoo Dubey



FIELD VISIT

Student visit Mobility India to understand the problems faced by people with disability.



In the space audit of Universal design studio and Design for retail experience studio, provided the user set, we have studied the set of activities a user performs in these studio's and noted the difficulties faced by them while performing these activities. Variety of user experiences & difficulties while using the studio is noted and were categorised into a set of difficulties which are cognitive difficulty, difficulty in locating, physical difficulty, ergonomic difficulty and technical difficulty. It is colour coded in proportions inside the icons of user set based on the percentage of difficulty they are facing. User facing the most difficulty while performing these activities is depicted. User set in arranged in a queue where the user who faced most difficulties is standing at the first and the user who faced minimum difficulty is standing in the last of the queue.



#1 SPACE AUDIT

A students attempt to understand the inclusivity problems of NID studio spaces.



#2 PHYSICAL MODEL

Representation of Inclusivity problems of diverse user while using a staircase .

Are specs sexy?

Universal Design Thinking
Product Audit

Abhishek Virmani | Dharsini

Spectacles

or eyeglasses are vision eyewear, with lenses mounted in a frame that holds them in front of a person's eyes, typically utilizing a bridge over the nose and hinged arms that rest over the ears.

Definition from Wikipedia

User Group



User Actions & Rating the problem



Principles based on user actions

	+yes	-yes
Flexibility in use	Ease of fit.	Non-customizable form
Equitable in use	Arms and nose area hand grip	Requires both hands grip
Simple & intuitive use	Simple light weight form	causes pain with longer use
Size and approach of use	Size based on facial form	Size not available for all
Low physical effort	Ambidextrous Product	Hinges get loose
Tolerance of error	Not an issue when stored in case	Prono to breakage
Perceptible of information	Frame guides user to hold	Not seen when camouflaged

Insights

- Majority of people dislike wearing spectacles.
- Dust accumulates in the nosepad, end pieces and across rim.
- Cleaning every day is a chore.
- Glasses become foggy or dewy.
- Rain on glasses irritates the user.
- Daily storage requires patience.
- Storing while travelling is a task.

Evaluating each part



5 Principles of UD

	Usable	Aesthetics	Cultural	Equitable	Economy
1	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
2	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
3	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
4	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
5	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●

Design Scope



#3 PRODUCT AUDIT

Audit of eye glasses base on UD principles.

What is on UD Product Audit?

The UD Product Audit is the study of a product, whether it meets the requirements of the user, how intuitive and efficient it is while a user is using it and where it is deviating in the performance elements. The product is examined according to the 5 universal design Indian standards: usable, cultural, economy, equitable and aesthetic of the product which will help to understand the need of the product according to the users point of view and will also help in improving it and fulfilling the user needs and difficulties.

'U' for umbrella

An umbrella also known as parasol, is a shield over the head of a user which helps in protecting the user from rain, sunlight and snow. It is made by using springs steel rod, a plastic handle and a sheet of waterproof material like nylon etc. The umbrella was invented over 4000 years ago and used in early civilizations in Egypt, Assyria, Greece, and China. They were initially employed as parasols to provide shade from the sun. The term comes from the Latin word *umbra* which means shadow.

Umbrella and its Indian context

Umbrella in India is both used in every household and is designed to protect users which use it to protect themselves from different weathers and is also used by the elder people as a walking stick and a support. The shape of umbrellas is also used as a staff, which is popular among them, the spot where it is connected is made by a golden junction known as *chakra* (pendant), so that steps and corners may not happen on this part and result in royal respect, and people may marvel at the royal legacy.

Characteristics

Umbrella is comprised of 5 things: a handle, a waterproof sheet and a rod that connects the handle and the upper sheet. The handle has a button that spins up the waterproof sheet which prevents the user from different weather like rain, sunlight and snow.

Parts of the Umbrella

Exploded view

Product Audit

UNIVERSAL DESIGN THINKING

RAHUL SHARMA | SWASTIK KOTIAN

UNIVERSAL DESIGN 2022

INDIAN INSTITUTE OF DESIGN

Insights

- Opening:** Head of both hands
 - Small size of releasing button
 - Slippery handle
 - Bumpy click button and the rod mechanism gets stuck
- Lifting:** User moves both arms holding the longer handles
 - Can't be used for longer period
 - Hard to hold in windy weather
 - Restricted body movement
- Closing:** Head of both hands
 - Water spreads over the body
 - Small handle is not easy to hold
 - Holding the button to push the upper part is difficult
 - Hands get wet
- Flipping:** Takes a lot of space
 - Gets misplaced due to seasonal use
 - Things around the umbrella get wet

User Sets

Universal Design India Principles

Principle	Equitable	Usable	Cultural	Economic	Aesthetics
Equitable	Many from different	Used to look	Not significant	Not affordable	Subtle Price
Usable	Many, Non adjustable	Less Ergonomics	Traditional Quality	Affordable	Working stick, support
Cultural	Not, better evolution	Easy Operable	Religious Connection	Cheaper	Color, Size, age
Economic	Variety of Choices	Low cost	Cultural Significance	Affordable	Color, Type, age
Aesthetics	Not, traditional, non adjustable	Not, traditional, non adjustable	Religious Aspects	Affordable	Type, Appearance

Principle	Pros	Cons
Equitable	Single button, adjustable	Bumpy click and
Usable	Easy operable, no difficult operation	Locking mechanism, rods get stuck
Cultural	Represents progressiveness by safety, shield protection	Unreal usage, reserved usage
Economic	Cheaper, easily available	Short life span, easily misplace
Aesthetics	Handle material, size, thickness	Less availability in vibrant colors, usage restricted to rain protection only.

Shortcomings

• High weight
• Opening button is not visible and gets stuck
• Locking mechanism is difficult and noisy
• Easy to slip
• Not easy to hold
• Not easy to hold in windy weather
• Water spreads over the body and makes it difficult to hold
• Not easy to hold in windy weather
• Not easy to hold in windy weather

Benefits

• Helpless
• Used as a walking stick
• Can be flipped as a staff
• Can be used as a support
• Can be used as a support
• Can be used as a support
• Can be used as a support
• Can be used as a support

Design Scope

- Canopy: Can be made from hydrophobic material that repels water and shed water drops doesn't stick to it. Easily replaceable by the user.
- Connecting Rod: Can be made from a material that can bend & take the form of the shoulder to support it.
- Handle: Can be made more comfortable to the handle & strap can be added to improve the grip.
- Fluorescent: A small led fluorescent can be introduced to the handle to see things in the dark.

DETTOL LIQUID SQUEEZY PACK

HOW DETTOL BECAME A HOUSEHOLD NAME IN INDIAN HOUSEHOLD

A large portion of Indian families is aware of the brand 'Dettol'. It's a well-known name in Indian households under the hygiene category. Dettol includes everything from liquid hand soaps to body washes to medicated plasters.

In India, Dettol resonates with protection. The products are high quality and affordable. This is one of the major reasons for the success and predominance of the brand in the country.

UNDERSTANDING THE PRODUCT BASED ON THE 5 UD PRINCIPLES

Principle	Insights
ECONOMY	The product is cheap and affordable for the consumers
USABLE	The product is easy to manufacture and cheap for the consumers
AESTHETICS	The form is eye-catching and interesting to look at.
CULTURAL	The brand has connect with the Indian audience. This makes them trust the authenticity of the product.
EQUITABLE	The product can be used by a diverse group of Indian users.

INSIGHTS

OPENING

- cognitive ability needed to open the squeeze bottle
- difficult to open the dispenser
- unclear where to press on the squeeze tube to dispense the hand wash
- difficult to open the bottle for refilling the handwash

DISPENSING THE LIQUID

- need to squeeze the bottle with a lot of pressure to dispense the liquid

CLOSING

- requires strength to open and close the dispenser
- difficult to close the bottle after refilling the handwash

EASE & CHALLENGES

PRINCIPLES	EASE	CHALLENGES
Flexibility in Use	Easy to carry	Opening and closing of the bottle
Equitable Use	Travel friendly	Not everyone can squeeze it with appropriate pressure
Simple and Intuitive Use	Only squeezing action required	The strain on hands caused due to applying pressure
Low Physical Effort	Ambidextrous product	Unable to tell when the product is empty
Tolerance for Error	No spillage	Strong grip required to use the product
Perceptible Information	Only dispenses the hand wash when open and the body is tilted	Difficult to open and the close the bottle for refilling

USER ACTIONS

USERS

Users	Ergonomic	Accessible	Intuitive	Unbiased	Easy to Use	Tolerance for Error
Child	1/5	1/5	1/5	1/5	1/5	1/5
First Time User	2/5	2/5	2/5	2/5	2/5	2/5
Physically Challenged	1/5	1/5	1/5	1/5	1/5	1/5
Elderly	2/5	2/5	2/5	2/5	2/5	2/5
Regular User	4/5	4/5	4/5	4/5	4/5	4/5

DESIGN SCOPE

- Clear instructions for first-time users
- Intuitive opening and closing of the dispenser
- Less strain on the hands for easy dispensing of the liquid
- Clear indications for knowing when the product is empty - translucent bottle
- Grip provided on the bottle to keep it slipping from the hands

#4 PRODUCT AUDIT

Audit of an umbrella based on UD principles.

#5 PRODUCT AUDIT

Audit of Dettol packaging based on UD principles.

Subject

FORM STUDIES

This course is for the first year Universal Design students to sensitise the importance of 'form' in their practice. The course will consist of activities that will help students to think and manipulate forms in 2D and 3D. It will also provoke them to look at forms around them in the natural and built environment and understand and observe more.

By the end of the course the students will have developed skills in model making, sketching, translating sketches into models.



WHAT IS A 'FORM'
An introduction to form.

YEAR

2021

FOR THE M.DES STUDENTS OF

Industrial Design
Interaction Design
Information Design
Digital Game Design
Design for Retail Experience

INSTITUTE

National Institute of Design

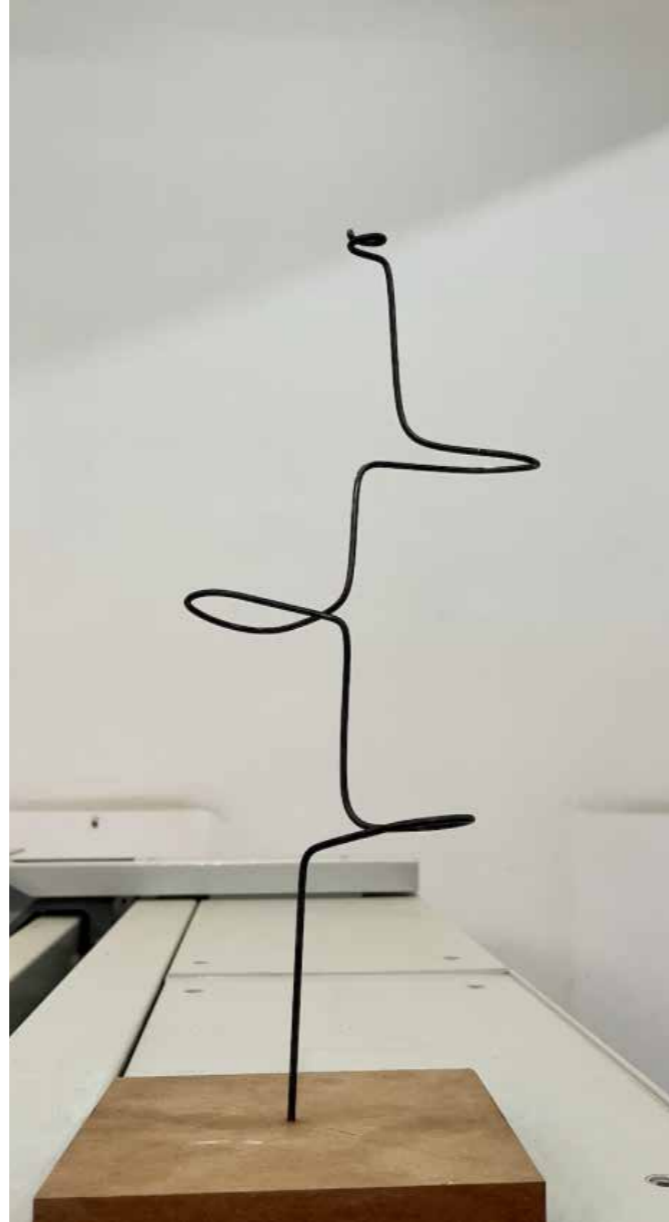
CO- TEACHERS

Nijoo Dubey
Balaji Rengarajan
Tulip Sinha



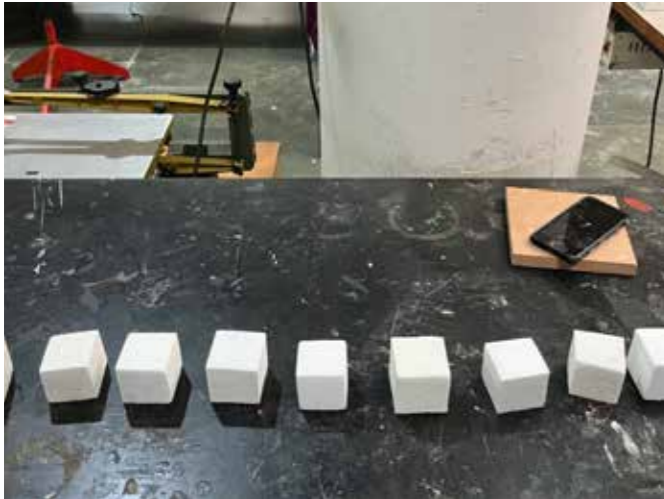
#1 AT WORKSHOP

Cutting MS rod to make 'lines in space'.



#3 LINES IN SPACE

A student attempt to make 'flow'.



#2 CUBES

Result of a session on making 'accurate' models.



#5 2D FORM STUDY

Students learning family of forms.



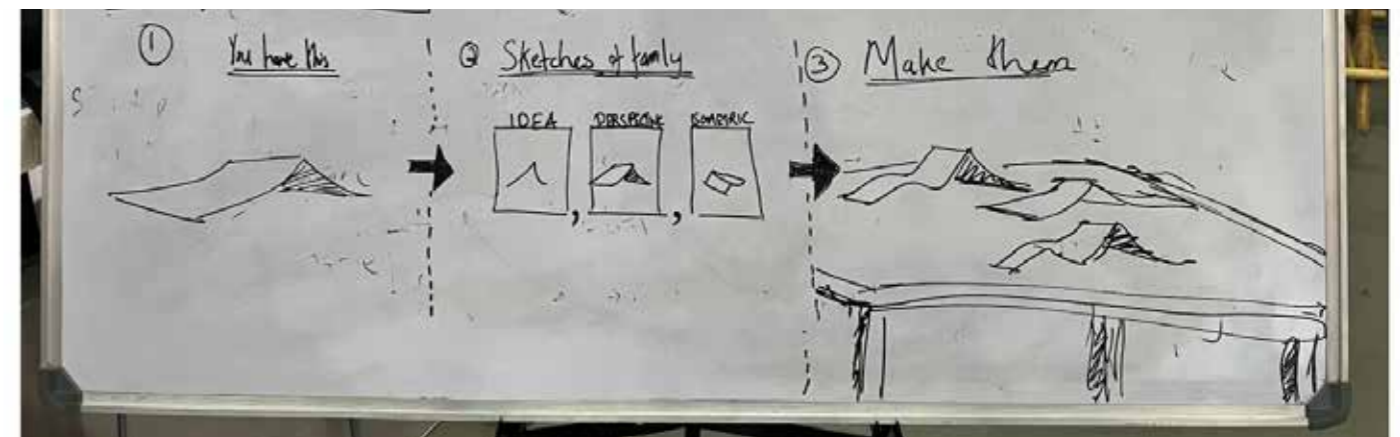
#6 PAPER MODELS

Students learning how to convert a lamina to a volume.



#4 VOLUME INTERACTION

Dominant, Sub-ordinate and Sub-Dominant form.



#7 FORMS AND SKETCHING

Step by step process of making 'family of forms'.

Design Workshop

TOY DESIGN THROUGH CRAFT



Relevance

The workshop will combine theoretical, practical lessons and field visits on "Play and its importance in education". Play is an intrinsic act done by children. Certain factors affect child play. Children need an enriched environment which is the combination of toys and friends. They need a lot of colourful materials around them. It is relevant because of a playful attitude about life and not taking everything like popularity, competition, academics and adult criticism seriously and taking; necessities of growing up, avoiding addictions, staying within the boundaries of the law, staying playful in an age-appropriate way.

The students will experience the art of Toy Making from the Artisans of Channapatna. They will develop designs that would cater to the needs of preschool children and align the designs into the manufacturing technique of Channapatna.

Objective

- The workshop aims at making the students understand the importance of Play and its relevance in Early Child Education.
- The students will go through a complete design process of making a toy from an idea to a finished product.
- They will also understand how the toys can be refined and polished to make them marketable through prototyping and testing.

Methodology

Lectures.
Assignments.
Individual design projects.
Field visit.

YEAR

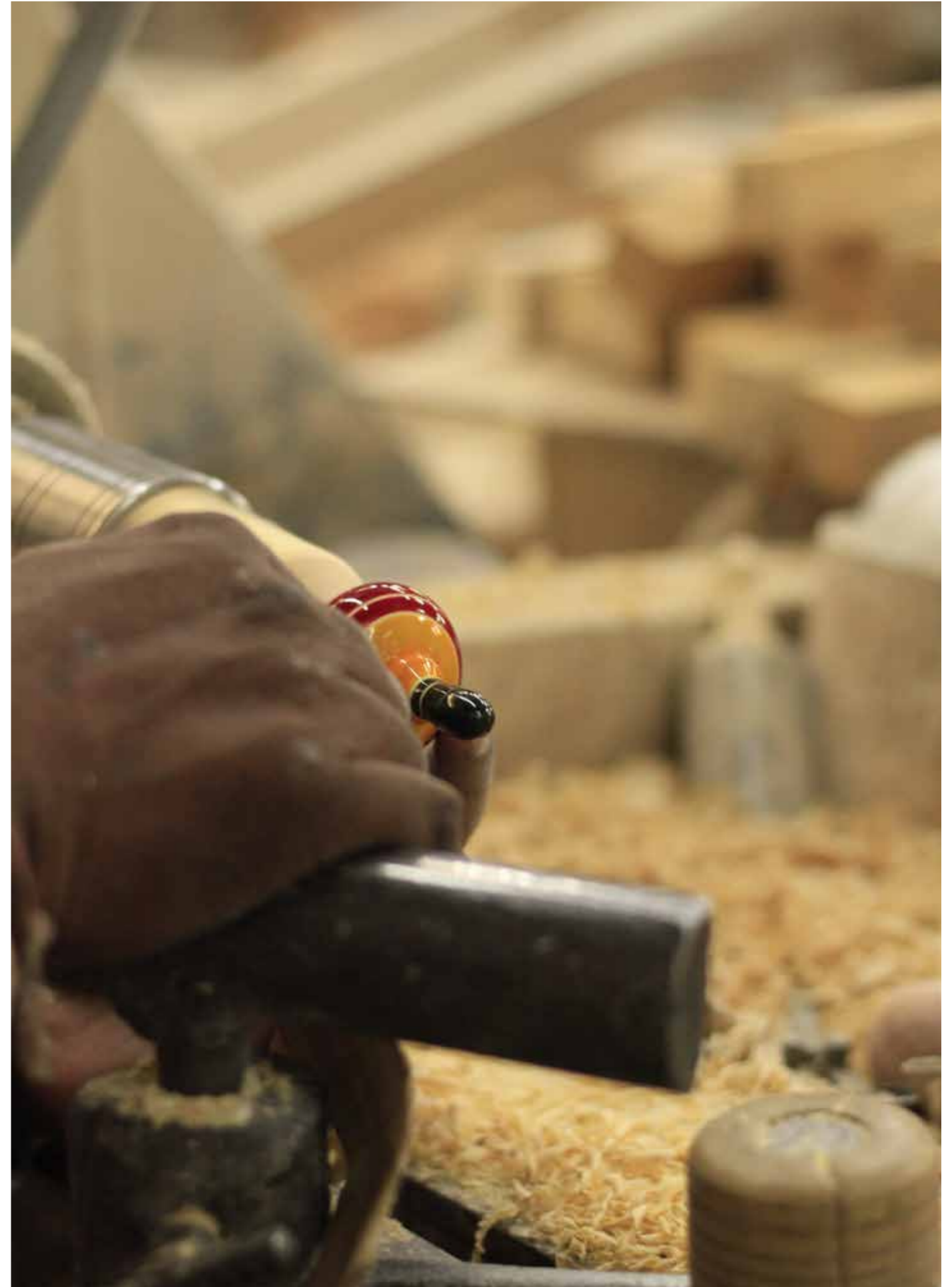
2022

FOR THE B.DES STUDENTS OF

Industrial Design
Furniture design
Communication design

INSTITUTE

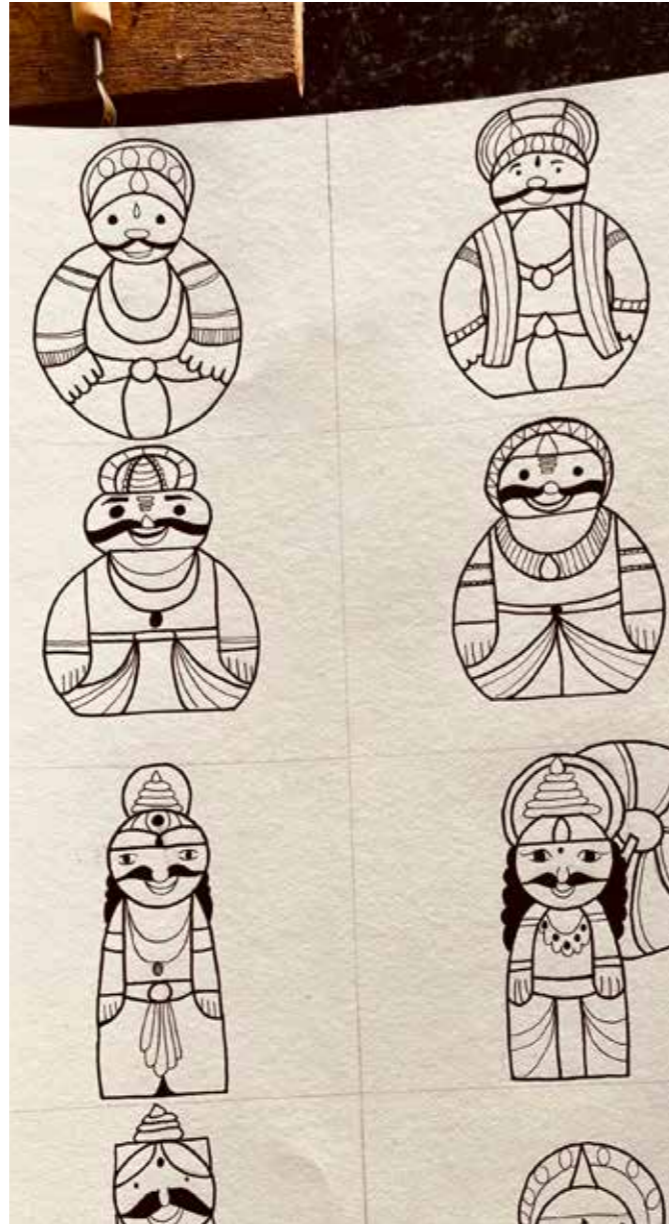
School of Design, RV University.



Wood turning technique of Channapatna
An artisan turning and colouring a spinner on a lathe.



#1 A CLAY MOCK-UP
A student's toy design exploration on clay.



#4 TOY DESIGN SKETCHES
Students exploration for toys.



#3 PAPER CUT OUTS
Radii manipulation and symmetry exercise.



#6 STUDENTS SKETCHING THEIR IDEAS AND MAKING PAPER MOCK-UPS
Ideas to sketches to mock-ups.



#7 HOW TO DESIGN TOYS
A lecture on 'designing for Play' and the design process.



#5 SPINNING TOP MOCK-UP
Mock up of spinning top made by the students.



#8 THE WORKSHOP
A student working on Lathe.

AUGMENTATION OF HEAT TRANSFER COEFFICIENT IN POOL BOILING USING COMPOUND ENHANCEMENT TECHNIQUES

ABSTRACT

Modern compact electronic chip design demands more efficient and innovative cooling techniques in a limited space. One such method is the immersion cooling by pool boiling heat transfer, which is a highly efficient technique when compared with conventional cooling techniques. The boiling heat transfer coefficient can be enhanced using active and passive techniques. In the present investigation grooves as passive and surface vibration as active techniques were coupled to improve the boiling heat transfer coefficient. The forced vertical vibrations were induced on the copper grooved surface with a mechanical vibrator. The frequency of vibration was varied in the range 0-100 Hz and the amplitude of vibration was varied in the range 0-2.5 mm. The compound technique gave 62% improvement in heat transfer coefficient at 300 kW/m² heat flux compared to the 29% enhancement due to grooves alone and 10% enhancement due to vibration alone. The experimental results were used to develop a modified Rohsenow correlation which predicts the experimental Nusselt number with an accuracy of $\pm 25\%$. Boiling visualization was performed and the bubble parameters such as bubble departure diameter, bubble frequency and bubble growth were determined. The bubble departure diameter decreased by almost 36% and the bubble frequency increased by 221% for boiling on vibrated grooved surface.

Weblink

https://scholar.google.com/citations?view_op=list_works&hl=en&hl=en&user=V88K664AAAAJ

YEAR

2014 - 2016

GUIDED BY

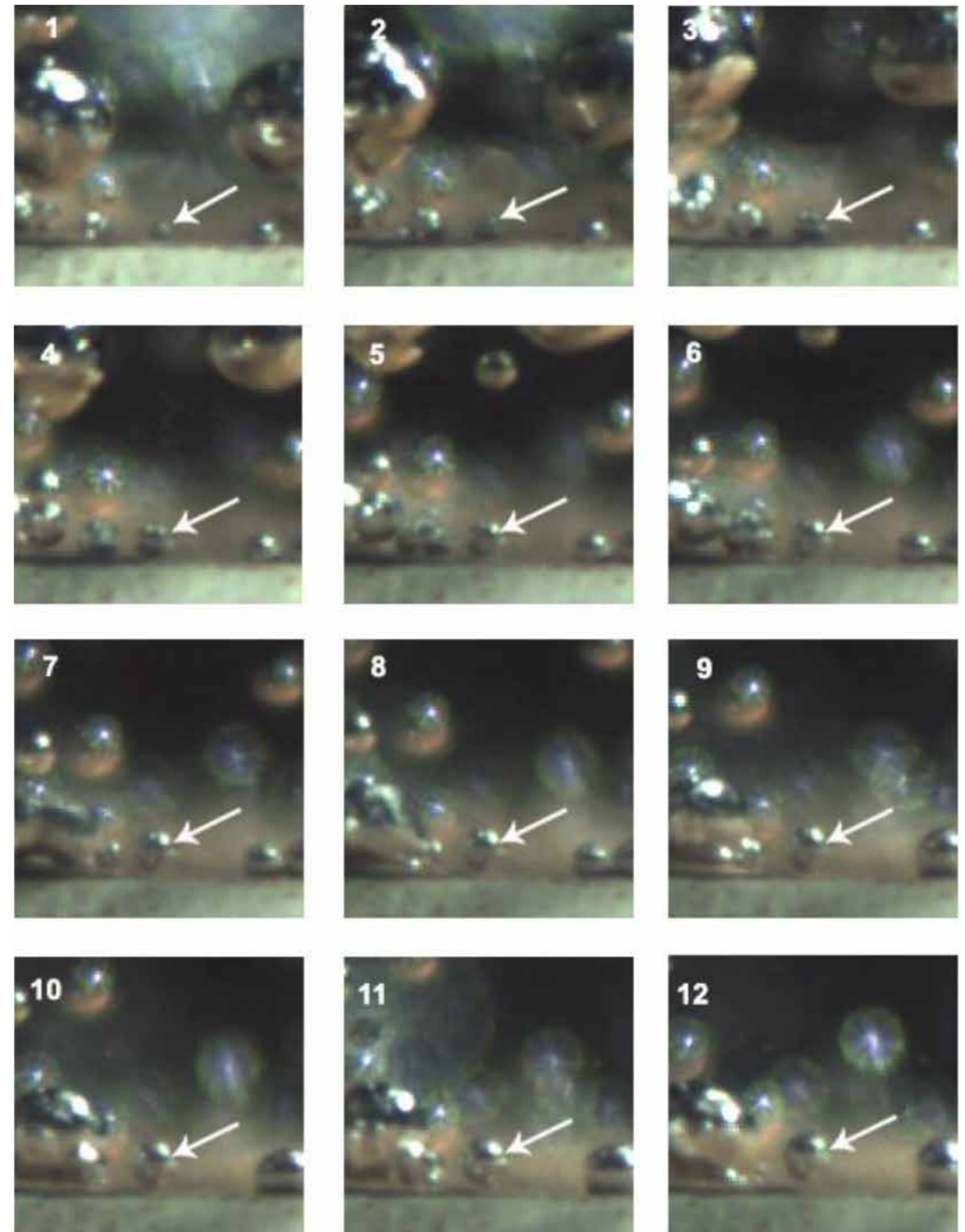
Dr. Sathyabhama A

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Department of Science and Technology
Government of India

INSTITUTE

National Institute of Technology, Surathkal



BUBBLE FORMATION

Images captured with high speed camera to observe the formation of bubbles.

AUGMENTATION OF HEAT TRANSFER COEFFICIENT IN POOL BOILING USING COMPOUND ENHANCEMENT TECHNIQUES

Athul Dinesh and Sathyabhama A.

Mechanical Department, NITK Surathkal,
Srinivasnagar P.O., Karnataka, India.



#1 EXPERIMENTAL SETUP

Copper heating element which boils water.

Introduction

- The thermal management of electronic chips has become a challenge with rapidly increasing power dissipation in recent years. This trend has driven the electronic cooling community towards ebullient cooling techniques. This is to acquire heat input and to reject waste heat for the purpose of achieving higher power density and higher system efficiency.
- Faster cooling rates increase energy conversion system efficiency, enable higher power density and also boosts system functionality. Heat dissipation has become an increasingly important problem that will limit the performance, as advanced microelectronic and photonic device technologies have led to ever smaller structures.
- Due to the lack of a breakthrough in advanced cooling technology, most of the computer processor speed has reached its limit with traditional cooling techniques and the future of more advanced computers is now in doubt.
- Most of the advanced power devices and high-tech electronic systems ranging from heavy-vehicle engines, computer chips and advanced nuclear reactors depend on efficient thermal energy transport mechanisms.
- Modern compact chip design demands more efficient and innovative cooling techniques in a limited space. One such method is the immersion cooling by pool boiling heat transfer.
- The boiling heat transfer coefficient can be enhanced using active and passive techniques. While most of the previous researches were done using either one of these techniques, the present investigation aims at combining both these active and passive techniques to improve the heat transfer coefficient.
- Grooved surface is used as the surface modification which is the passive technique and the heater is made to vibrate using an exciter which is the active technique used.
- The compound enhancement technique used in this current research is found to enhance the heat transfer coefficient remarkably.

Materials and methods

The experimental setup consists of a square boiling chamber into which the Teflon insulated heating rod is placed vertically and it is coupled to an exciter by a shaft. The test surface is placed on top of this heater rod. An auxiliary heater is provided through the side walls to maintain the distilled water at constant saturation temperature throughout the experiment. Three thermocouples placed along the length of the rod close to the test surface are used to measure temperature gradient and heat flux. The frequency and amplitude of the exciter is controlled using a power oscillator. The pressure inside the boiling chamber is kept constant throughout the experiment by the help of cooling water pump, a pressure transducer and a proportional integral derivative (PID) pressure controller.

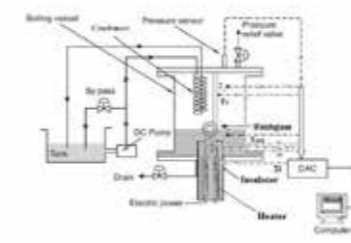


FIGURE 1. Schematic diagram of the experimental setup

First the experiment is conducted with grooved surface on the heater without any vibration. Then, the grooved surface on the heater is made to vibrate with varying frequencies and amplitude.



FIGURE 2. Vibration assembly

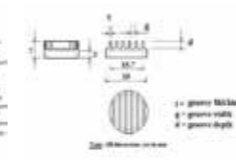


FIGURE 3. Rectangular grooved surface

Experimental results

The objective of this study was to evaluate the effects of surface enhancement and vibration excitation on the boiling heat transfer coefficient. Data collected from the experiments are represented in the form of graphs to provide a clear understanding of the improvement in heat dissipation which the compound enhancement techniques provides. All the heat flux and the HTC (heat transfer coefficient) data gathered from the experiments conducted are plotted systematically. The boiling curves in which, the wall superheat is plotted as the function of the heat flux, represents the trends in boiling under different conditions. Initially the experiments were done without test surface vibration. The results obtained from these experiments were used as the base data for comparing with the data obtained from experiments with vibration. It was observed that HTC gets enhanced only till 2 mm amplitude when the vibrational frequency is 5 Hz. The values dropped below the 'no vibration' curve when amplitudes were further increased above 3 mm. Improvement in heat dissipation was observed only for 1mm amplitude when the frequency was 10 Hz. At high heat flux the HTC values were not improved.

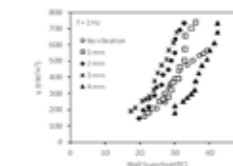


FIGURE 4. Effect of vibration on boiling curve at f = 2Hz

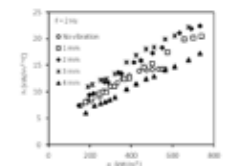


FIGURE 5. Effect of vibration on HTC at f = 2Hz

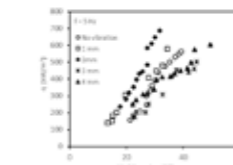


FIGURE 6. Effect of vibration on boiling curve at f = 5Hz

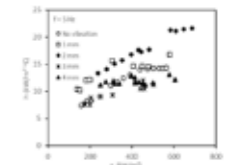


FIGURE 7. Effect of vibration on HTC at f = 5Hz

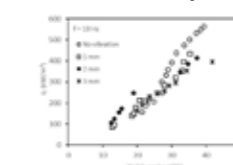


FIGURE 9. Effect of vibration on boiling curve at f = 10Hz

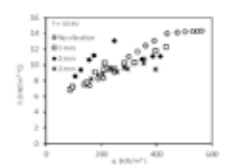


FIGURE 10. Effect of vibration on HTC at f = 10Hz

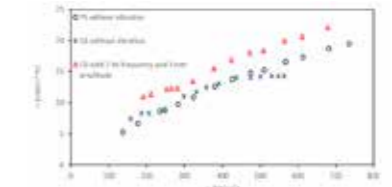


FIGURE 8. Effect of surface modification and compound enhancement on the boiling curve

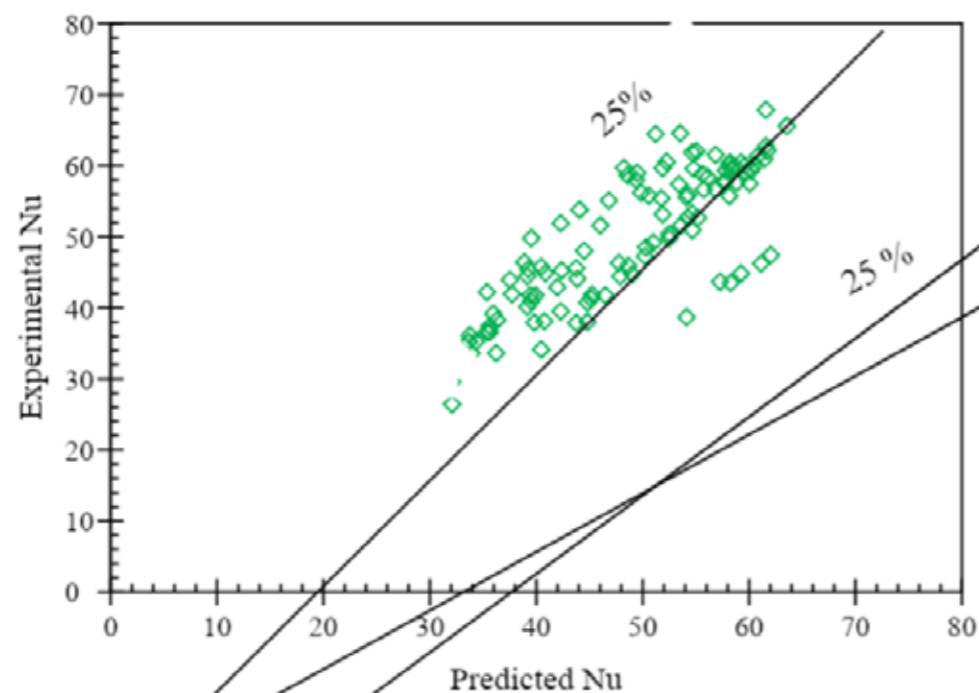
Conclusions

- From the current study on effects of compound enhancement technique on HTC, the following conclusions may be drawn.
- The compound technique gives more heat transfer enhancement than other techniques. This can be attributed to enhanced bubble nucleation from the grooved surface and better bubble departure from the test surface due to induced vibration.
 - The experimental results showed that the heat transfer rate increased with low frequency vibrations.
 - The enhancement of heat transfer was the highest at the vibrational frequency of 2 Hz and the amplitude of 3 mm.

References

- Nukiyama, S., 1934, "The Maximum and Minimum Values of Heat Transmitted from Metal to Boiling Water under Atmospheric Pressure," *J. Jpn. Soc. Mech. Eng.*, 37, 367-374.
- P. J. Marto and Li. V. J. Leperc, "Pool boiling heat transfer from enhanced surfaces to dielectric fluids," *ASME J. Heat Transfer*, vol.104, pp. 292-297, May 1982.
- V. F. Prisyakov, and K. V. Prisyakov, "Action of vibrations on heat and mass transfer in boiling," *Journal of engineering physics and thermo physics* 74, no. 4 (2001): 1015-1023.

$$Nu = 6.2434 (Re)^{0.4232} (Pr)^{1.957} (Re_v)^{0.01064} (A_f)^{2.613}$$



#2 NEWLY DEVELOPED CORRELATION

The graph shows the difference between experimental and predicted Nusselt's number

#3 PAPER PRESENTED INTERNATIONAL HEAT TRANSFER CONFERENCE 2015

The paper was presented at Indian Space Research Organisation, Thiruvananthapuram.