Webinar

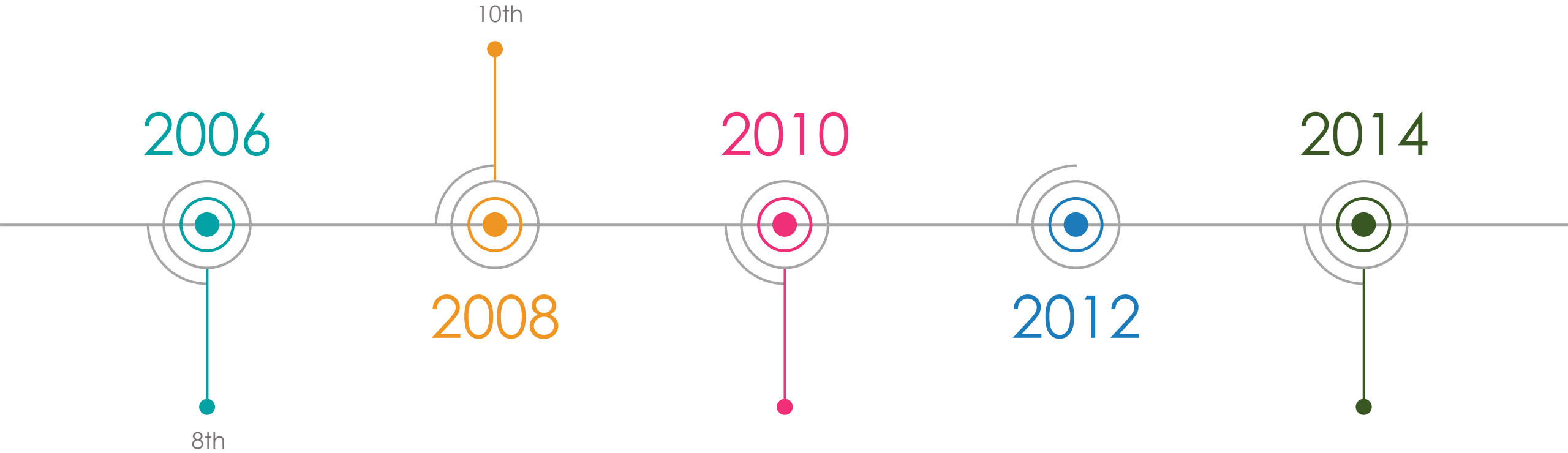
भाग 1

Background

भाग 2

Project based skill development

Shatad Purohit



Keshavraj Vidyalay Latur

BE Mechanical Engineering, M. S. Bidve Engineering College Latur

2014

2016

2018

2020

2021

R&D Quality Assurance Engineer, Dassault Systèmes

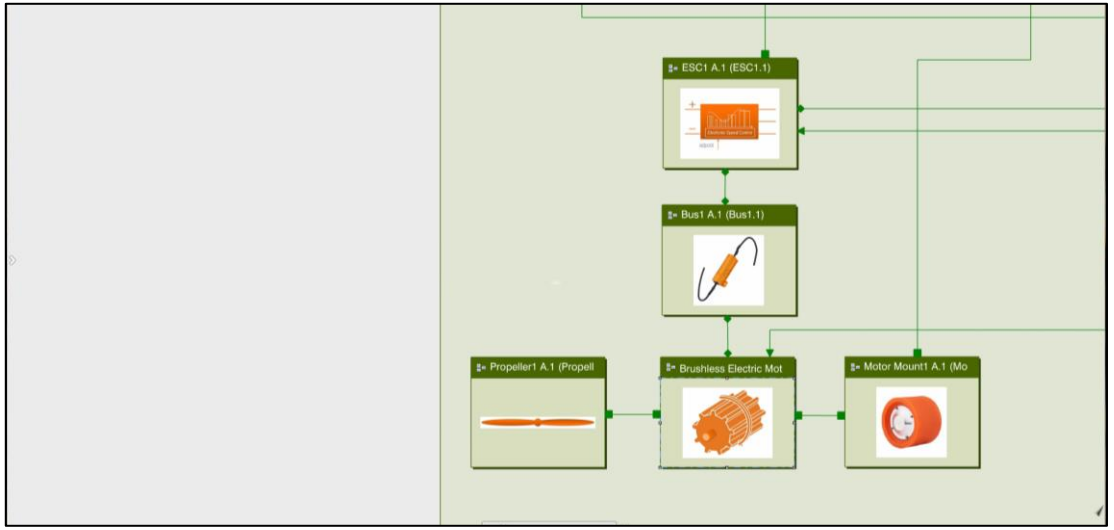
Master of Science in Systems Architecting and Engineering, University of Southern California

Ph.D. in Astronautical Engineering with Specialization in Systems Architecting and Engineering, University of Southern California

All the information presented in the webinar is in public domain

Views presented in the webinar are of presenters and do not represent any other entity.

Research: Systems Architecture

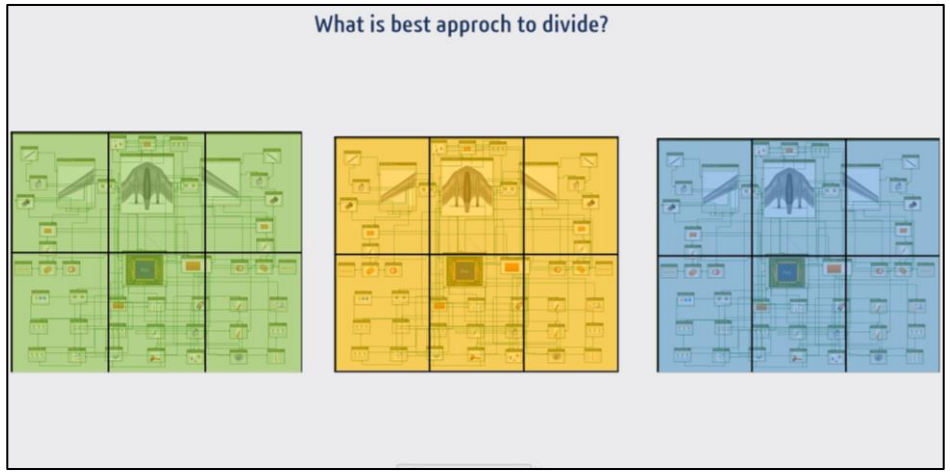


- S. Purohit and A. M. Madni, "Model-Based Systems Architecting and Integration Approach Using Inter-Level and Intra-Level Dependency Matrix", accepted for IEEE Systems Journal 2021
- A. M. Madni, S. Purohit, D. Erwin, and R. Minnichelli, Analyzing Systems Architectures using Inter-Level and Intra-Level Dependency Matrix (I2DM), submitted to 2019 IEEE International Conference on Systems, Man and Cybernetics, Bari, Italy.
- S. Purohit, and A. M. Madni, Presentation on Latent IP to Thurston Garrett (Dassault Systèmes), Gau Pagnanelli Christi (Boeing), on Aug 2019

कार्यसंघातील कामाचे उत्कृष्ट विभाजन कसे करावे

how to best divide the work within a team

Research: Systems Architecture



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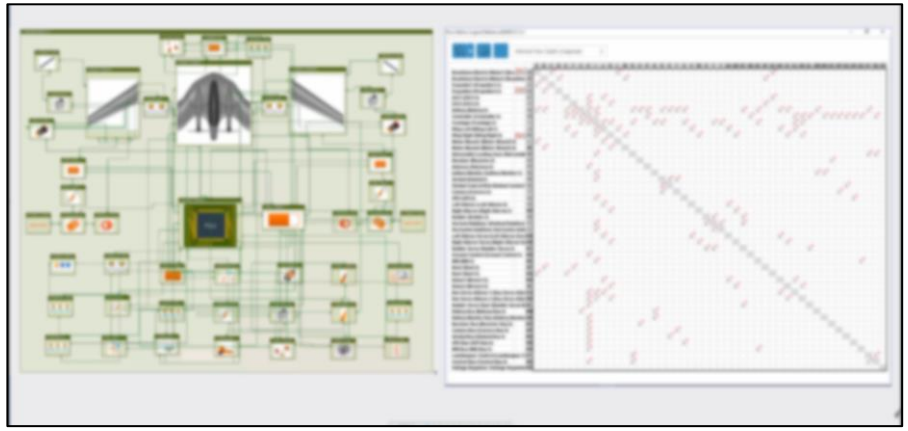
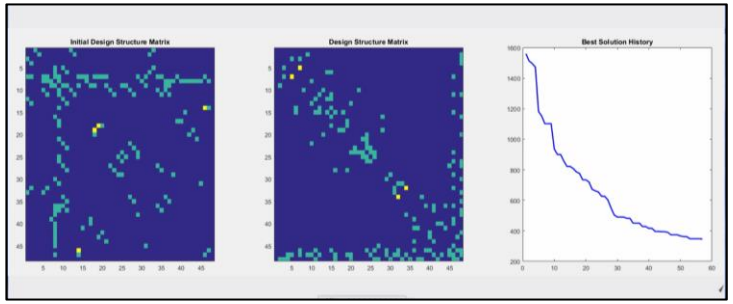
Research: Systems Architecture





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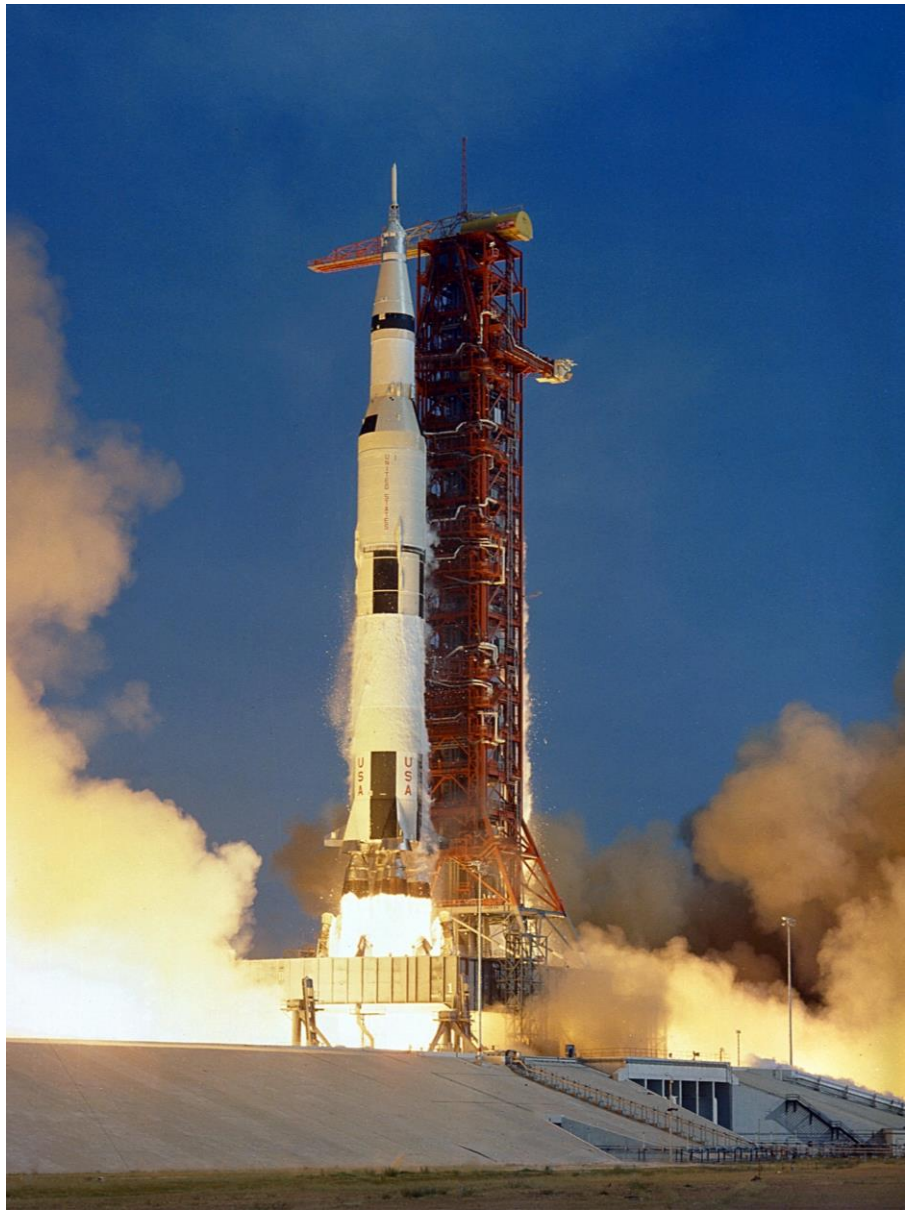
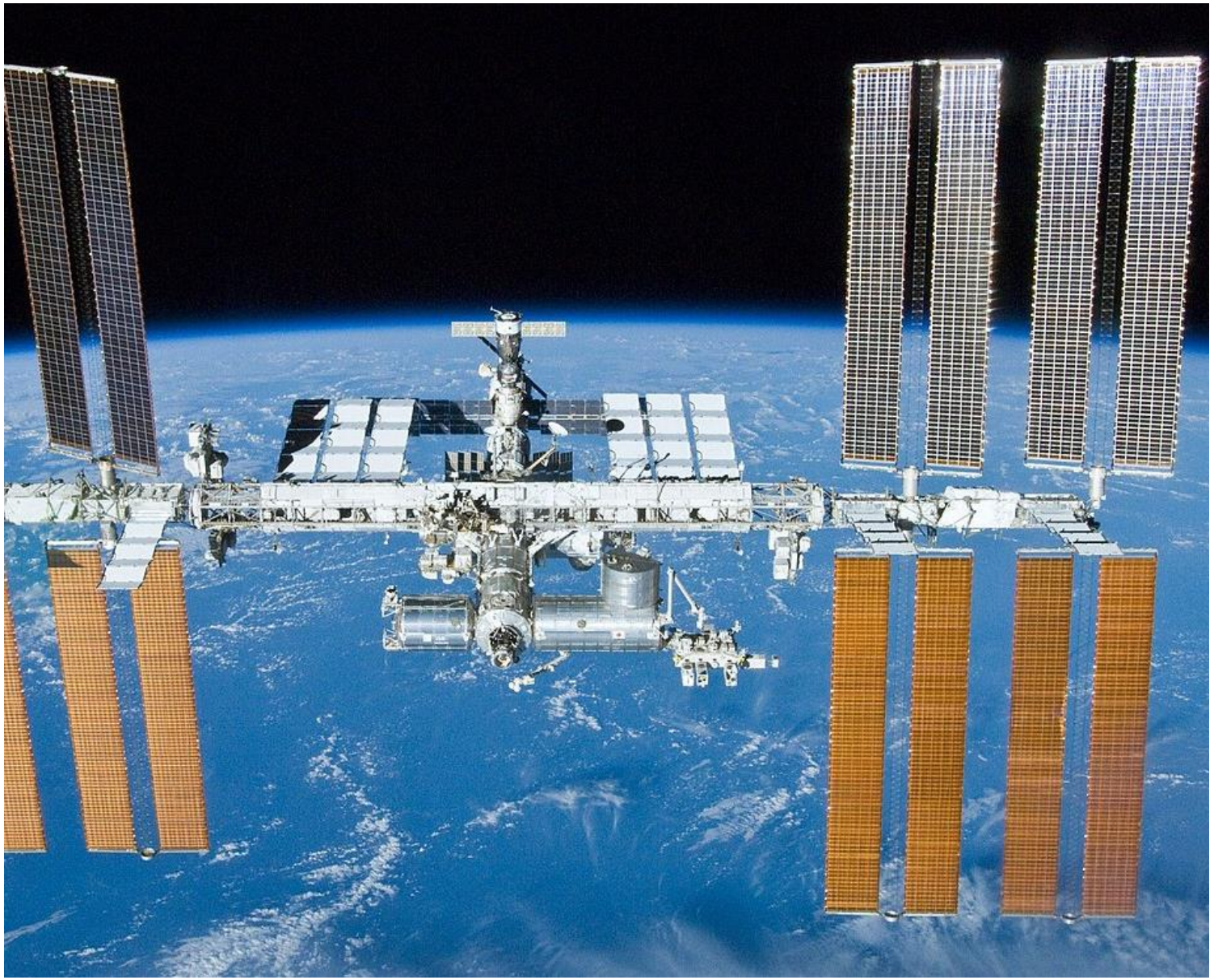
कॉम्पलेक्स सिस्टमचे विभाजन कसे करावे हे ठरविण्यात संगणक मदत करू शकते

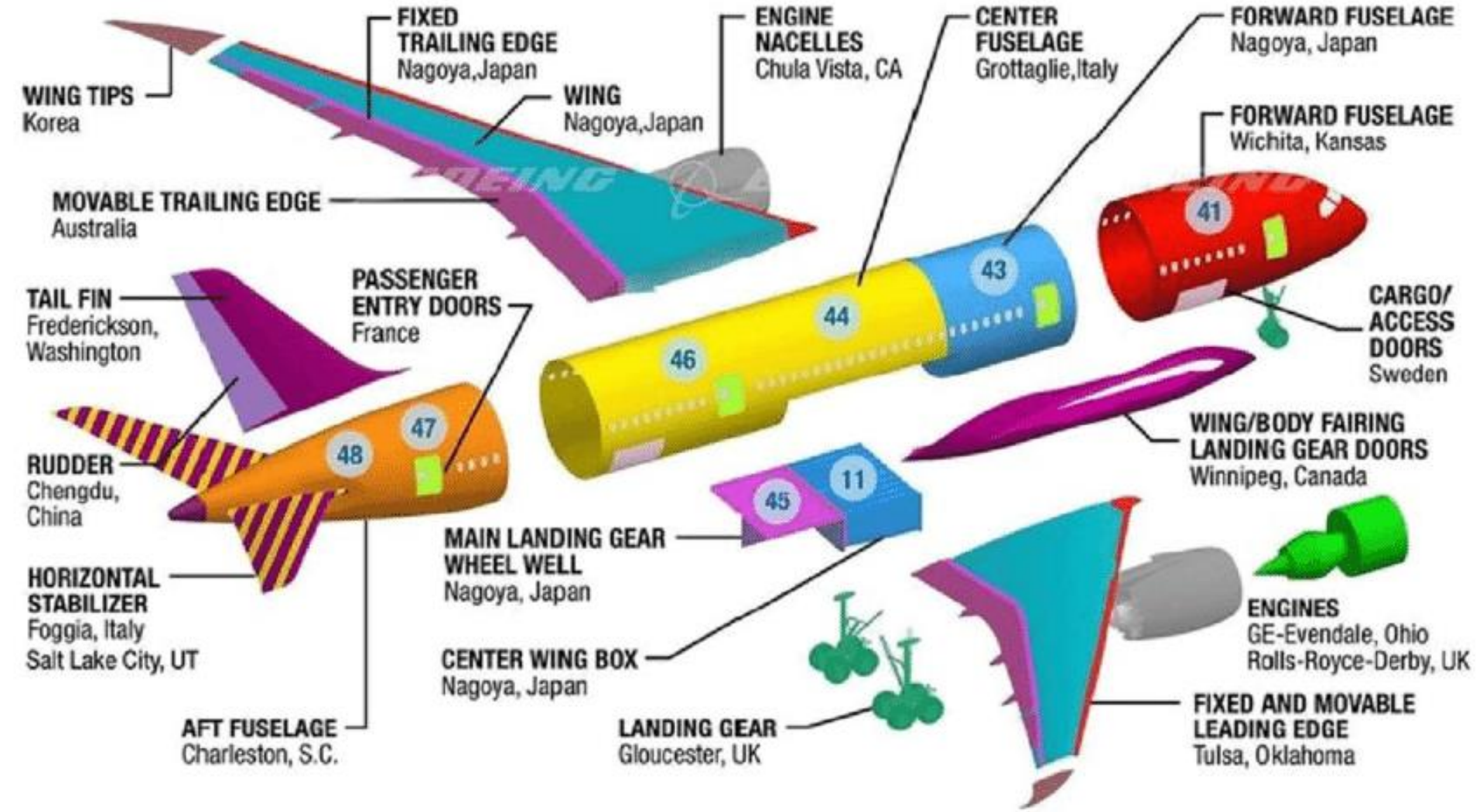
computers can help decide how to partition complex systems

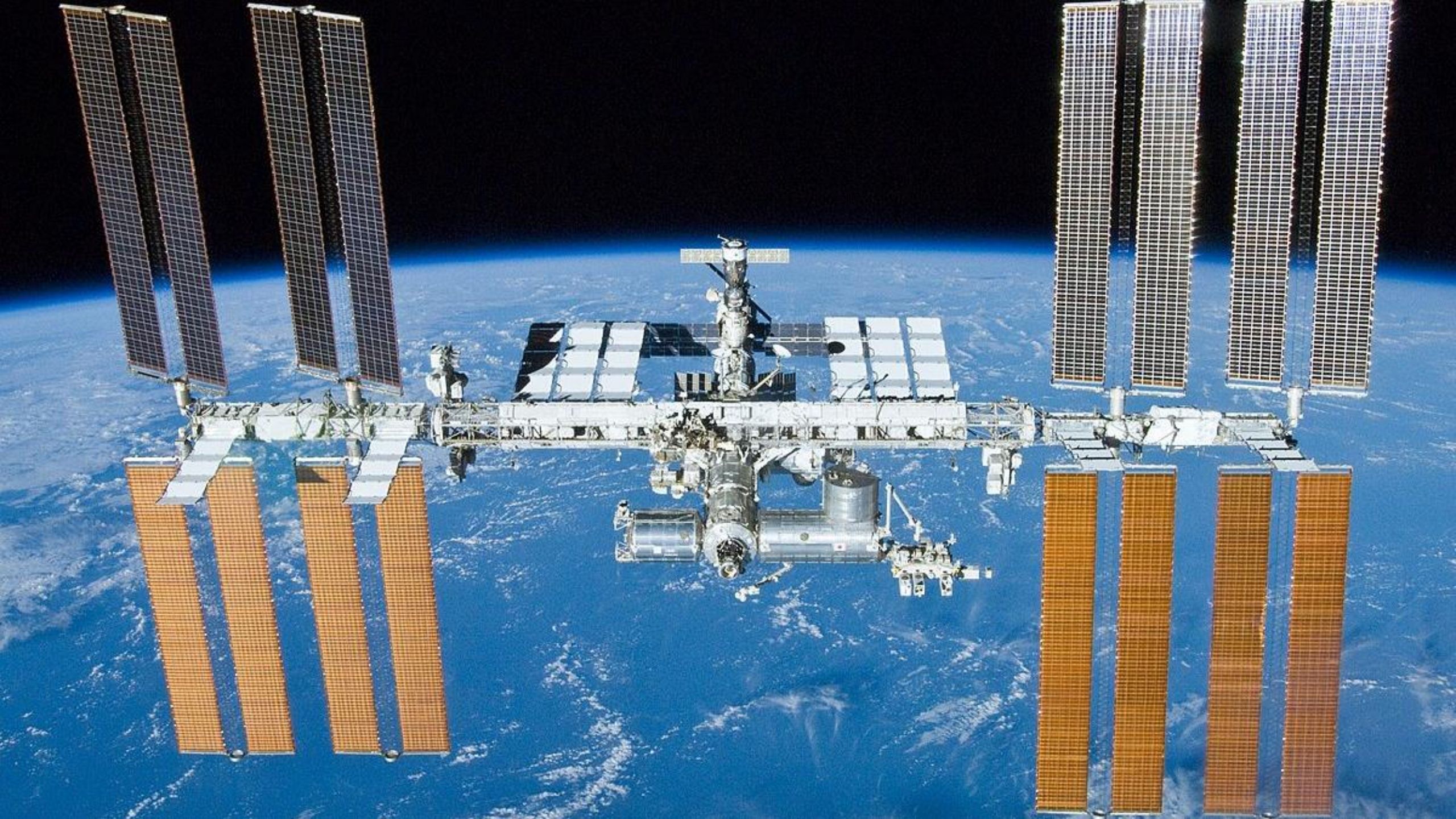

USA
USA

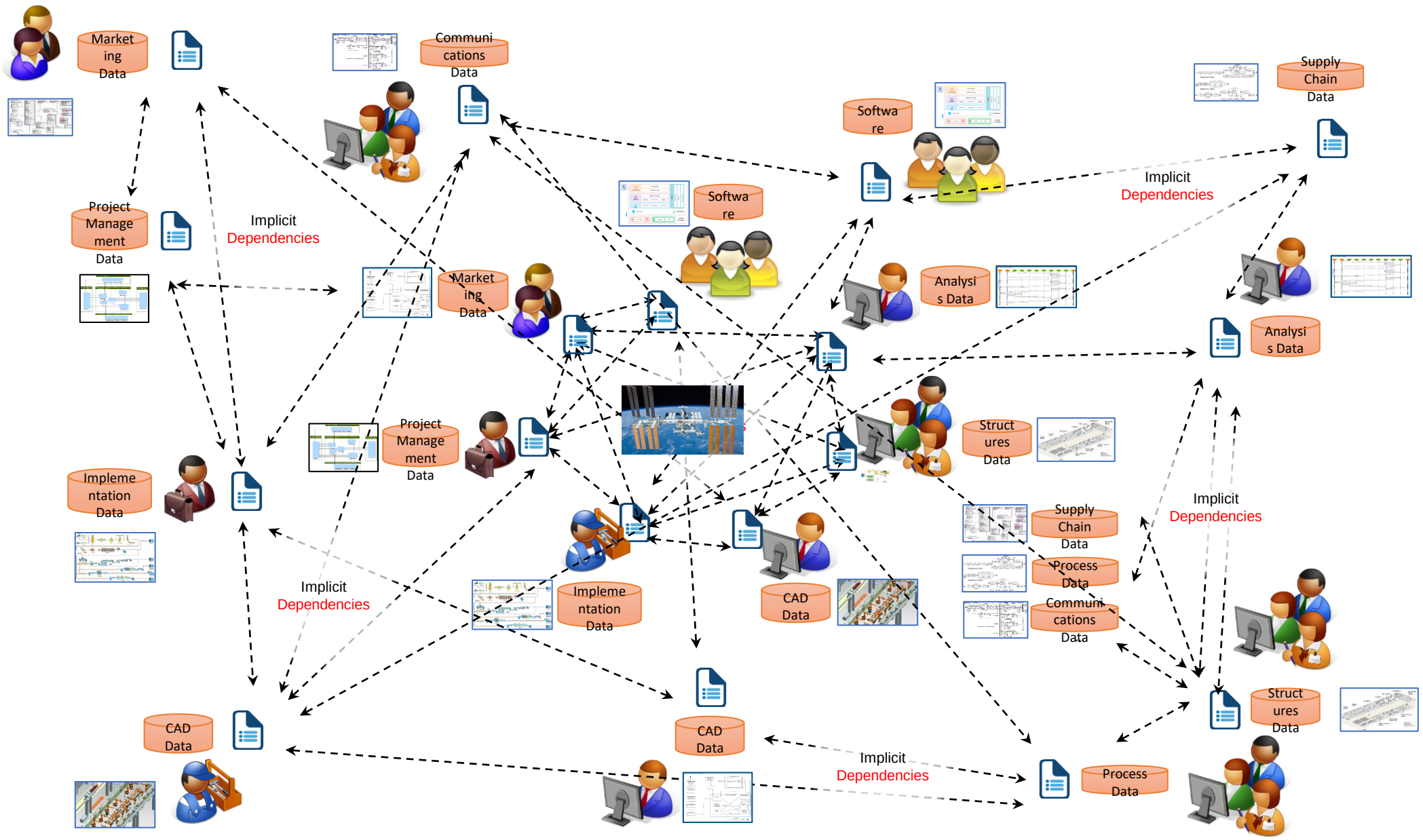


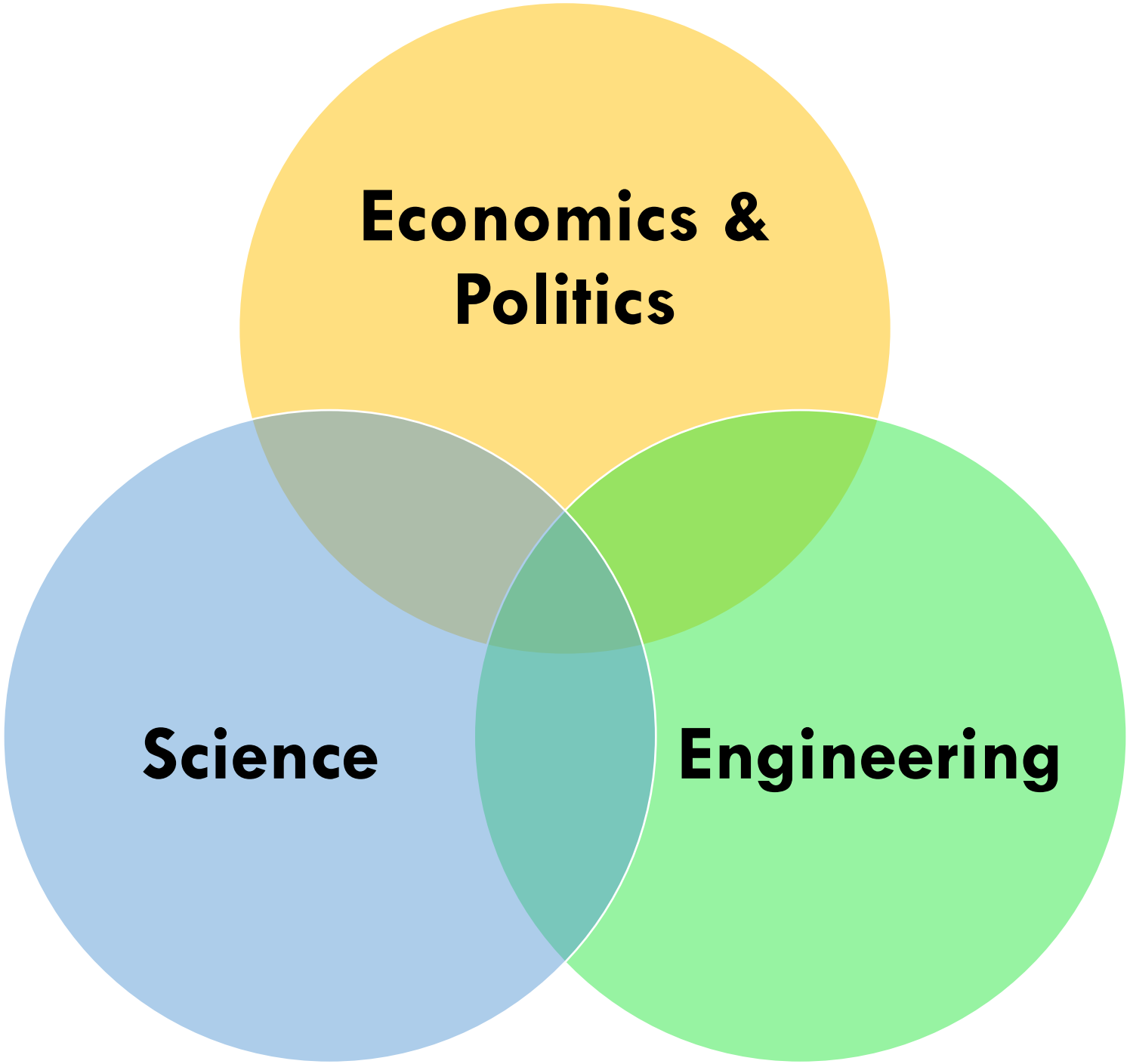
THE COMPANIES

U.S.	CANADA	AUSTRALIA	ASIA	EUROPE
Boeing	Boeing	Boeing	Kawasaki	Messier-Dowty
Spirit	Messier-Dowty		Mitsubishi	Rolls-Royce
Vought			Fuji	Latecoere
GE			KAL-ASD	Alenia
Goodrich			Chengdu Aircraft Industrial	Saab

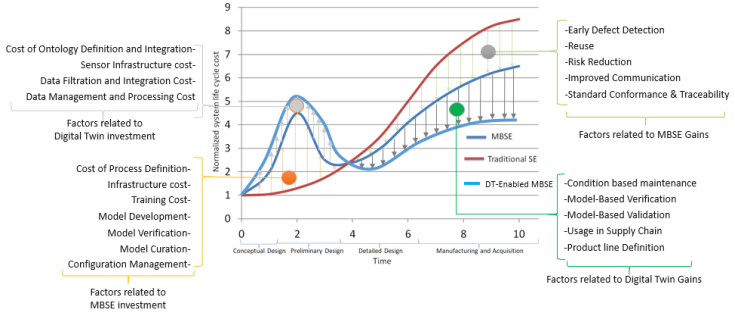





Market ing Data
Communi cations Data
Supply Chain Data
Softwa re
Softwa re
Implicit Dependencies
Project Manage ment Data
Implicit Dependencies
Market ing Data
Analysi s Data
Analysi s Data
Project Manage ment Data
Struct ures Data
Impleme ntation Data
Supply Chain Data
Process Data
Communi cations Data
Implicit Dependencies
Implicit Dependencies
Impleme ntation Data
CAD Data
CAD Data
CAD Data
Struct ures Data
Implicit Dependencies
Process Data

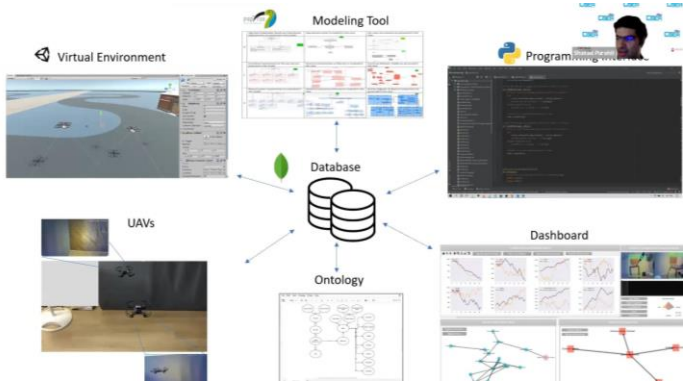

Economics &
Politics
Science
Engineering

Research: Economics



- S. Purohit and A. M. Madni, "Towards Making the Business Case for MBSE," accepted at CSER 2020, 18th Annual Conference on Systems Engineering Research, Redondo Beach, California, USA.
- A. M. Madni and S. Purohit, Economic Analysis of Model-Based Systems Engineering. Systems 2019, 7, 12.

Research: Digital Twins



- S. Purohit and A. M. Madni, "Employing Digital Twins within MBSE: Preliminary Results and Findings," accepted at CSER 2020, 18th Annual Conference on Systems Engineering Research, Redondo Beach, California, USA.
- A. M. Madni, D. Erwin, S. Purohit and C. C. Madni, "Digital-Twin Enabled Experimentation Testbed for MBSE," 2021 AIAA Scitech, doi:https://doi.org/10.2514/6.2021-0201
- A. M. Madni, C. Madni, S. Purohit, and A. Madni, Digital Twin Technology-Enabled Research Testbed for Game-Based Learning and Assessment in Theoretical Issues of Using Simulations and Games in Educational Assessment, O'Neil, H. (Eds.), Taylor & Francis, Spring2020

- Model-Based Systems Engineering,
- Systems Architecting
- Autonomous UAVs and Ground Robots.

8th

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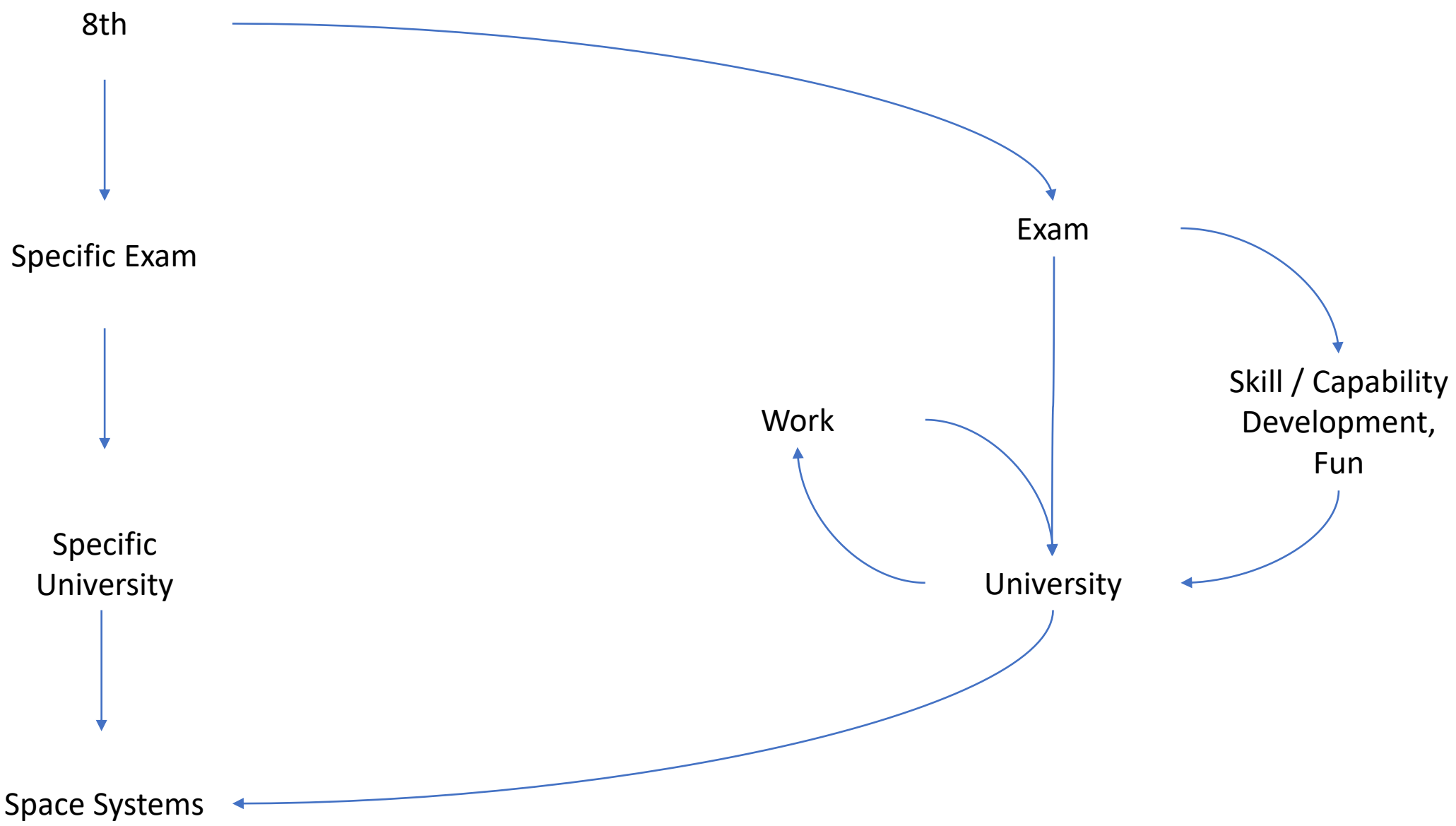
Specific Exam

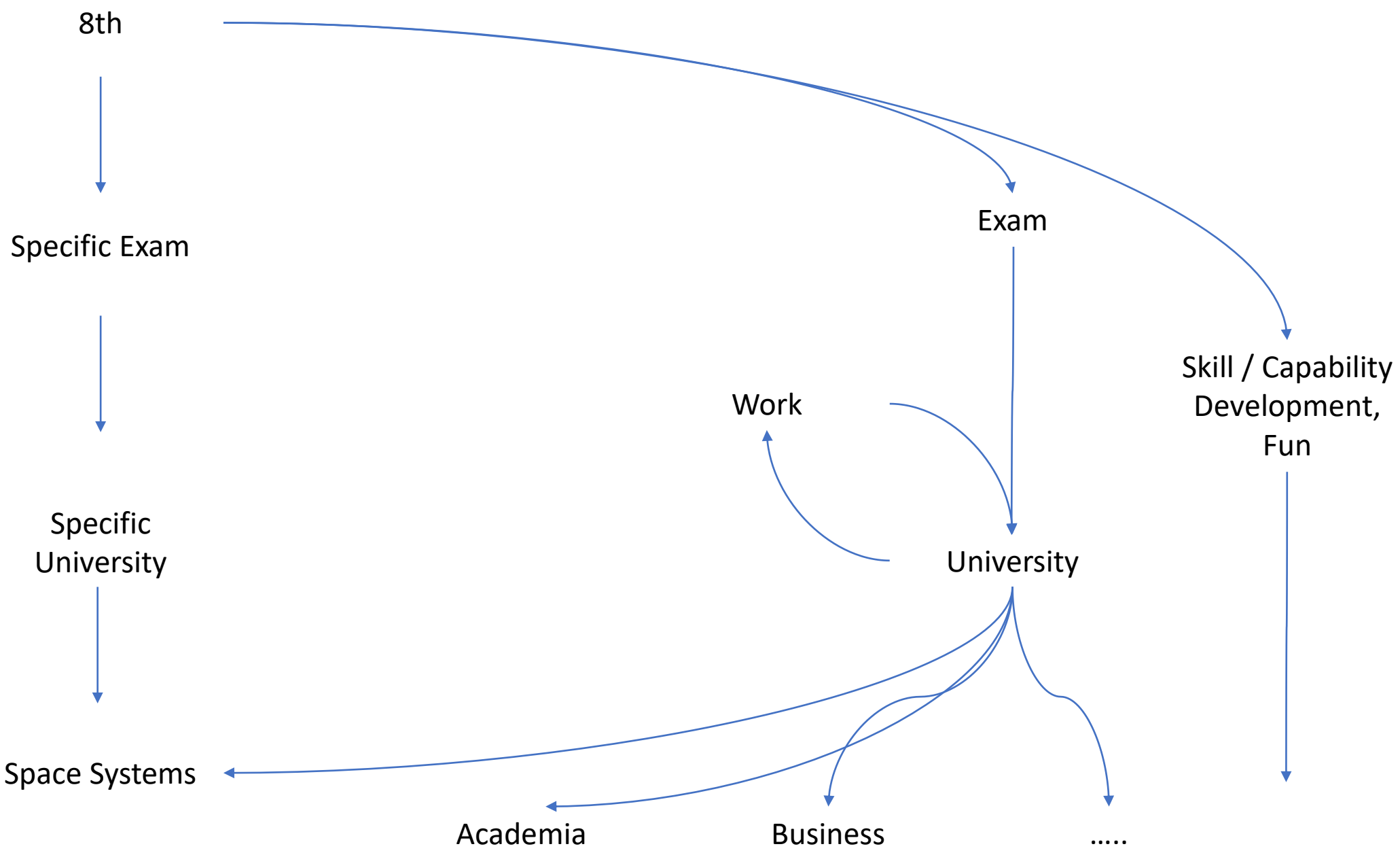
↓

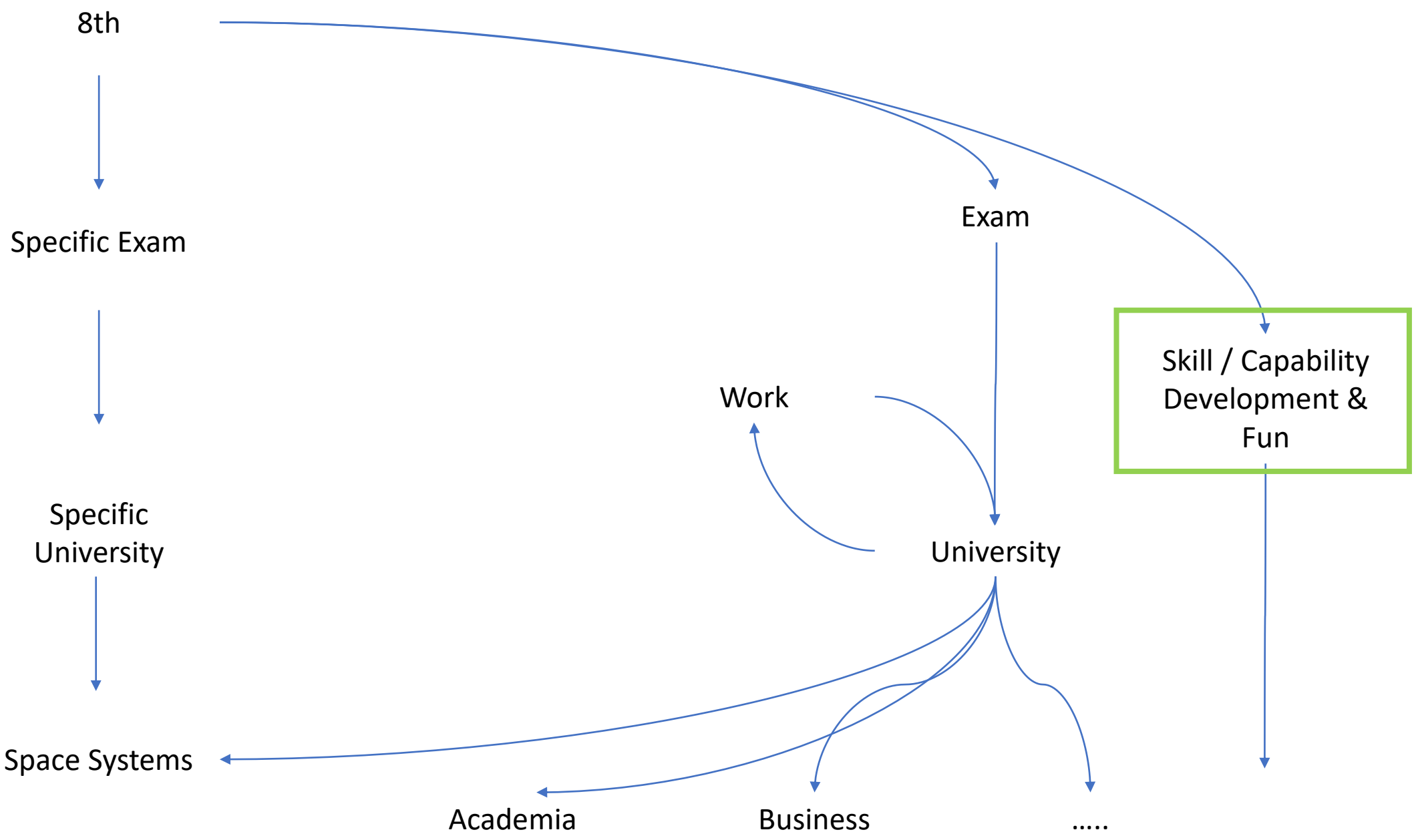
Specific University

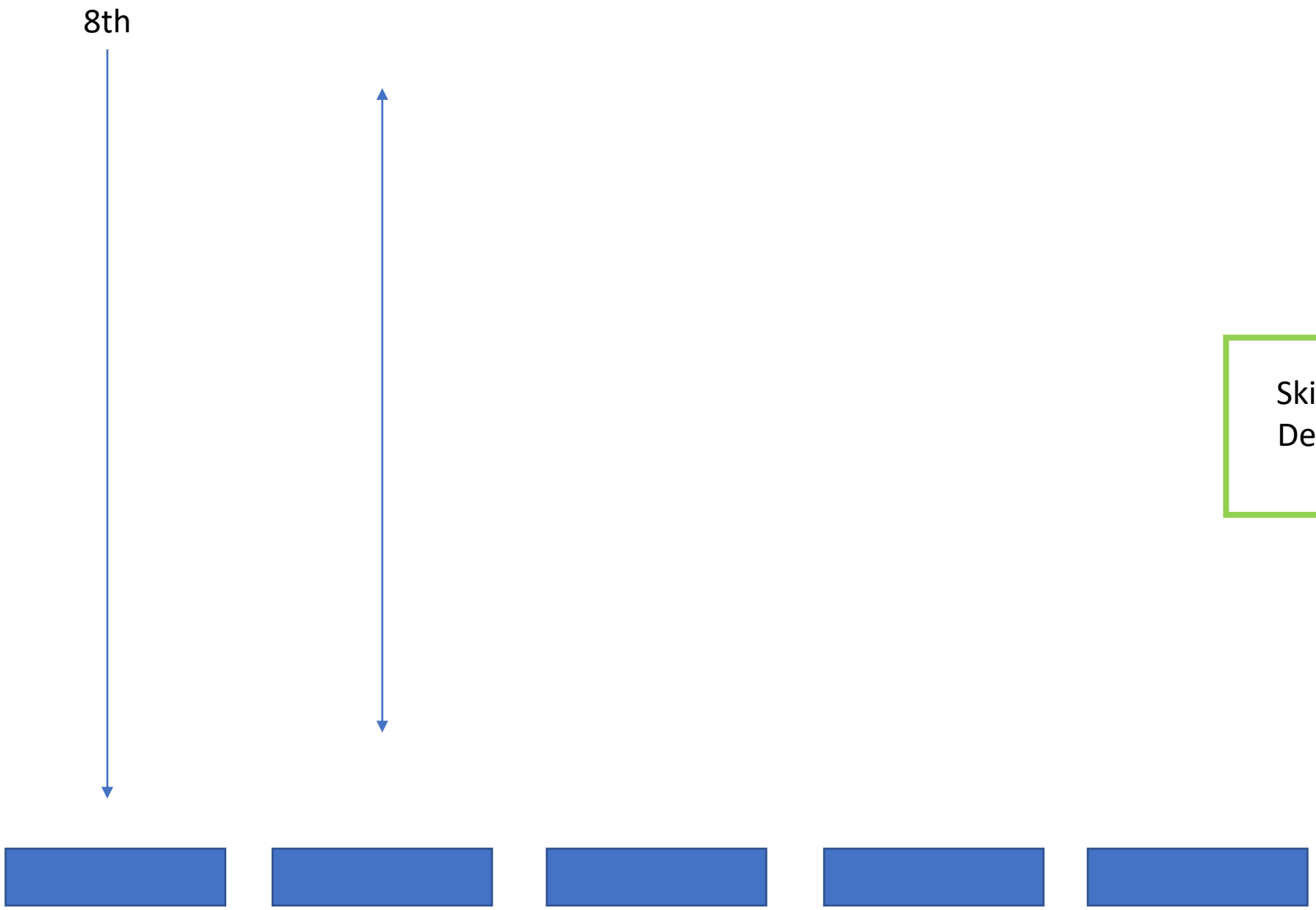
↓

Space Systems

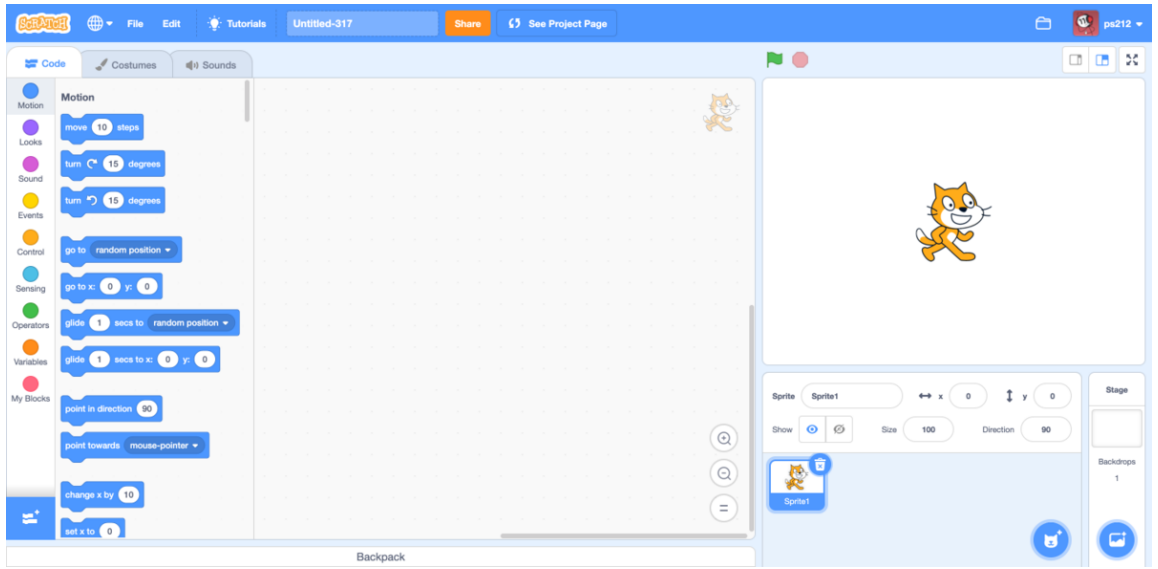

8th
Specific Exam
Specific University
Space Systems
Exam
Skill / Capability Development, Fun
Work
University


8th
Specific Exam
Specific University
Space Systems
Exam
Work
University
Skill / Capability Development, Fun
Academia
Business
.....

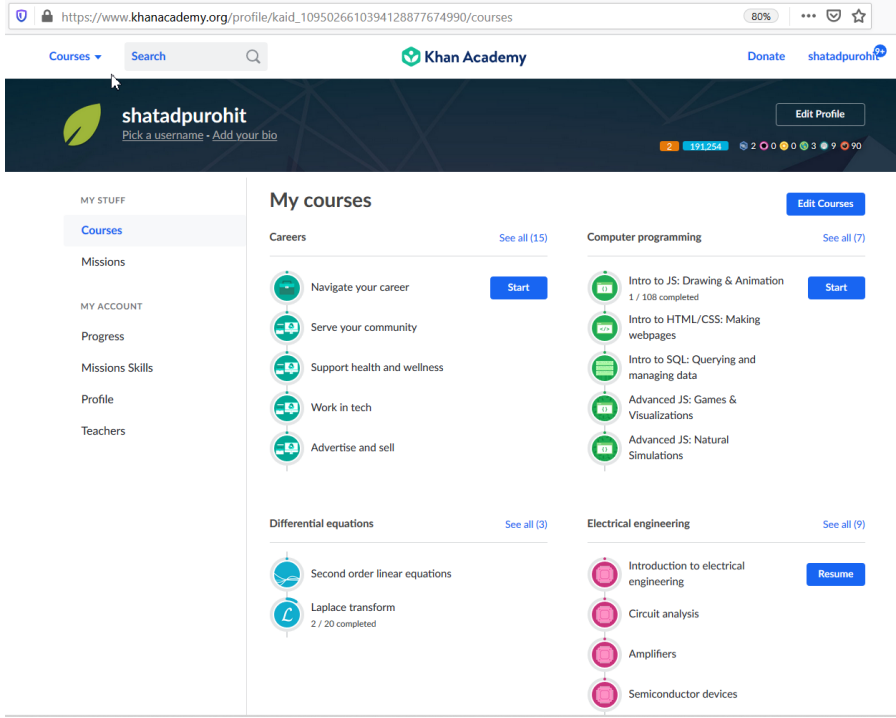

8th
Specific Exam
Specific University
Space Systems
Exam
Work
University
Skill / Capability Development & Fun
Academia
Business
.....



Skill / Capability Development & Fun

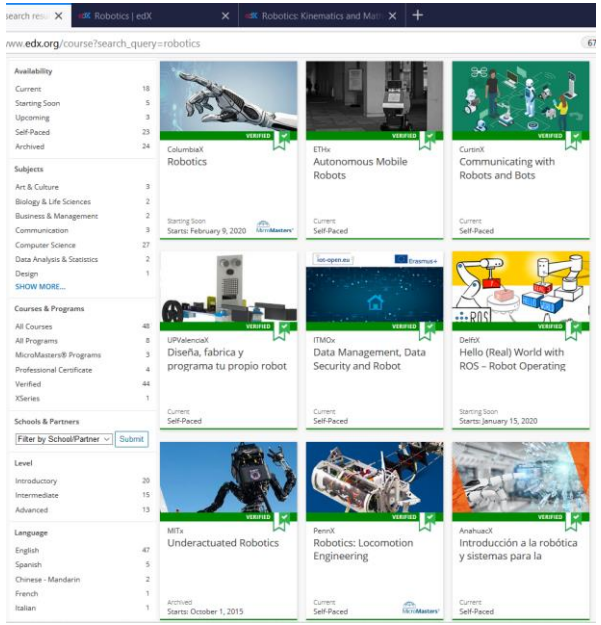


khanacademy

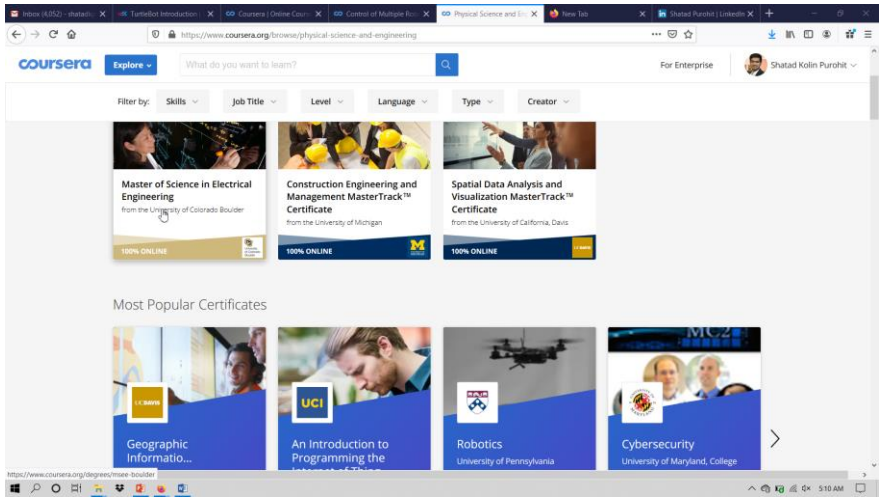


Scratch

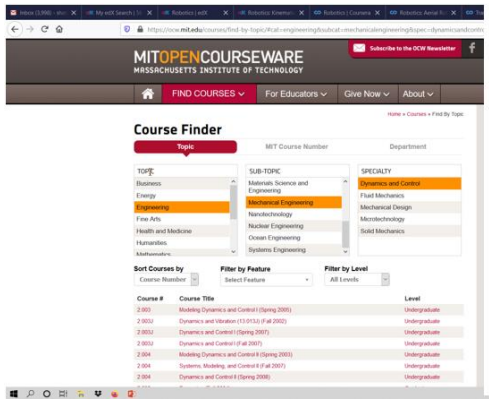
edx



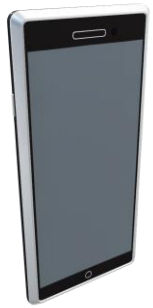
coursera



MITOCW



Course #	Course Title	Level
2.003	Modeling Dynamics and Control I (Spring 2005)	Undergraduate
2.003J	Dynamics and Vibration (13.013J) (Fall 2002)	Undergraduate
2.003J	Dynamics and Control I (Spring 2007)	Undergraduate
2.003J	Dynamics and Control I (Fall 2007)	Undergraduate
2.004	Modeling Dynamics and Control II (Spring 2003)	Undergraduate
2.004	Systems, Modeling, and Control II (Fall 2007)	Undergraduate
2.004	Dynamics and Control II (Spring 2008)	Undergraduate
2.032	Dynamics (Fall 2004)	Graduate
2.04A	Systems and Controls (Spring 2013)	Undergraduate
2.12	Introduction to Robotics (Fall 2005)	Undergraduate
2.14	Analysis and Design of Feedback Control Systems (Spring 2014)	Undergraduate
2.141	Modeling and Simulation of Dynamic Systems (Fall 2006)	Graduate
2.154	Maneuvering and Control of Surface and Underwater Vehicles (13.49) (Fall 2004)	Graduate
2.160	Identification, Estimation, and Learning (Spring 2006)	Graduate
2.161	Signal Processing: Continuous and Discrete (Fall 2008)	Graduate
2.171	Analysis and Design of Digital Control Systems (Fall 2006)	Graduate
2.18	Biomolecular Feedback Systems (Spring 2015)	Undergraduate
2.737	Mechatronics (Fall 2014)	Graduate
10.450	Process Dynamics, Operations, and Control (Spring 2006)	Undergraduate
16.07	Dynamics (Fall 2009)	Undergraduate
16.61	Aerospace Dynamics (Spring 2003)	Undergraduate
22.921	Nuclear Power Plant Dynamics and Control (January IAP 2006)	Graduate



भाग 1

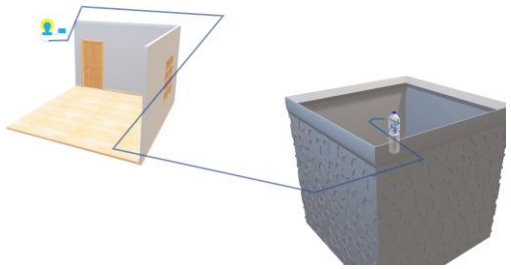
Background

भाग 2

Project based skill development

दीर्घकालीन प्रकल्प आधारित कौशल्य विकास

Long Term Project Based Skill Development



10th

2006

2008

2010

2012

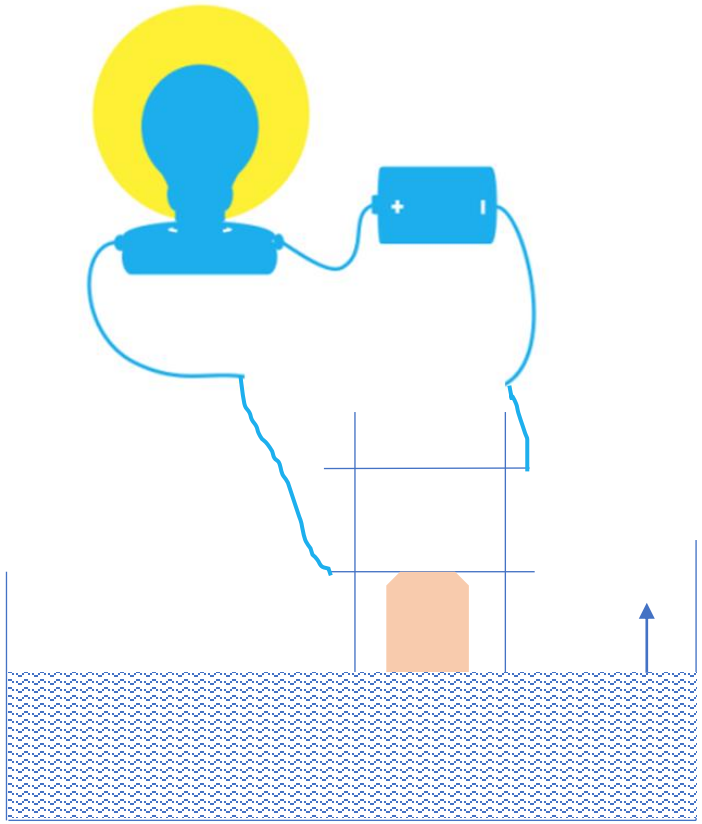
2014

8th

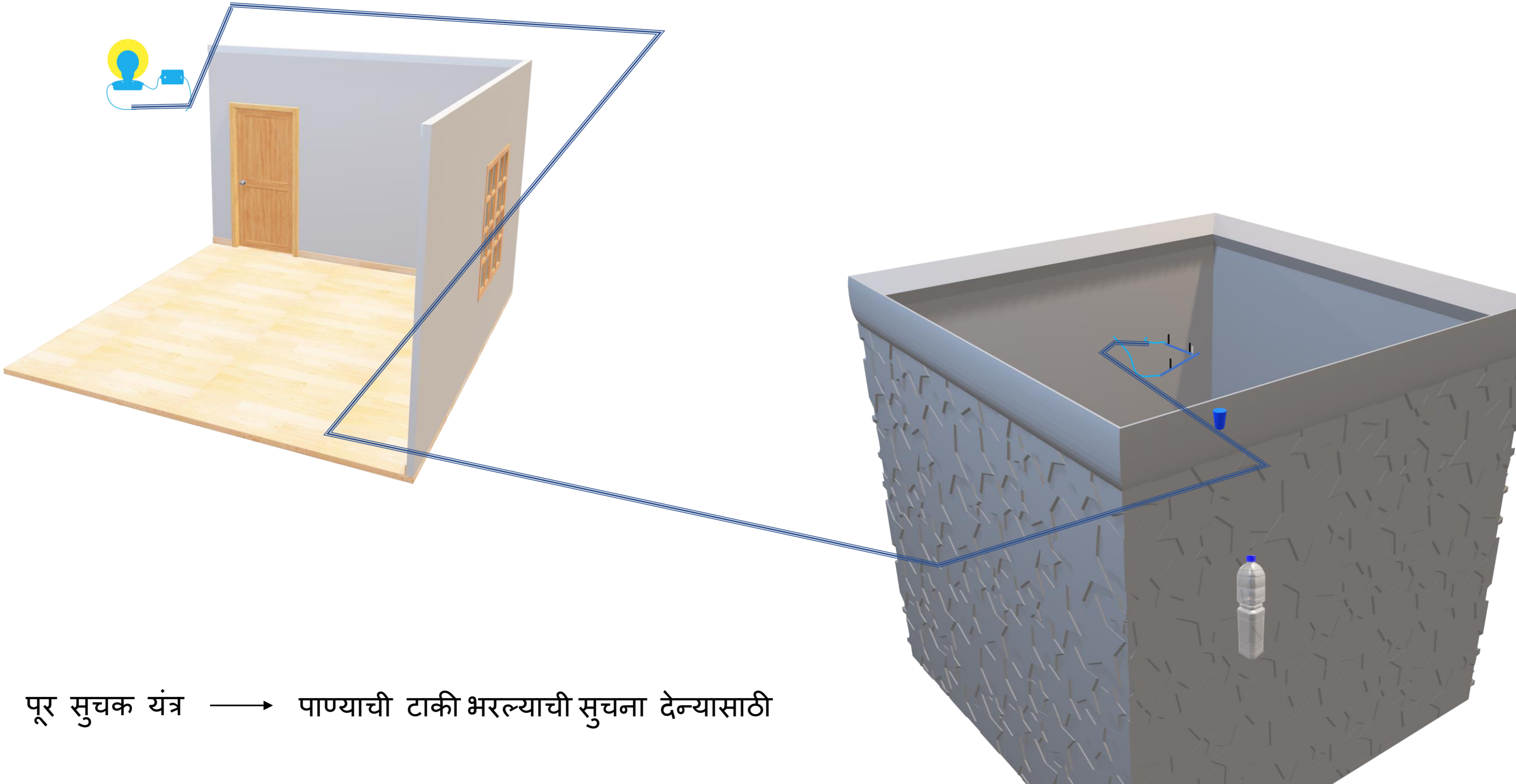
Keshavraj Vidyalay Latur

BE Mechanical Engineering, M. S. Bidve Engineering College Latur

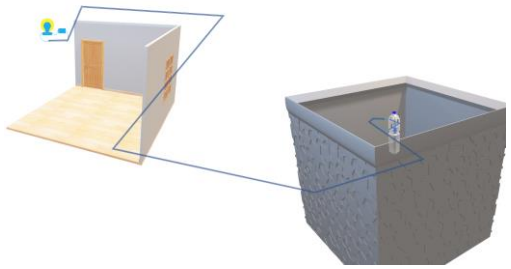
पूर सुचक यंत्र



Study Archimedes Principle -> Book Project -> Project Relevant for People Near You -> Simple Commercialization



पूर सुचक यंत्र ⟶ पाण्याची टाकी भरल्याची सुचना देन्यासाठी



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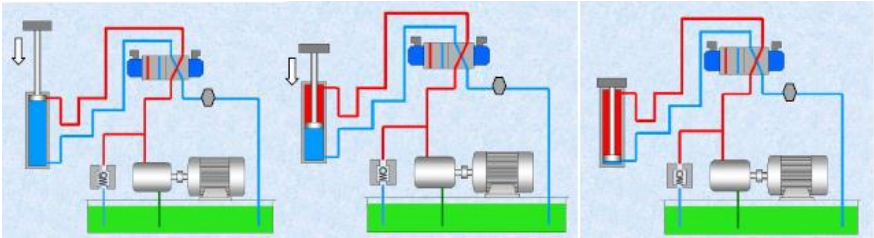
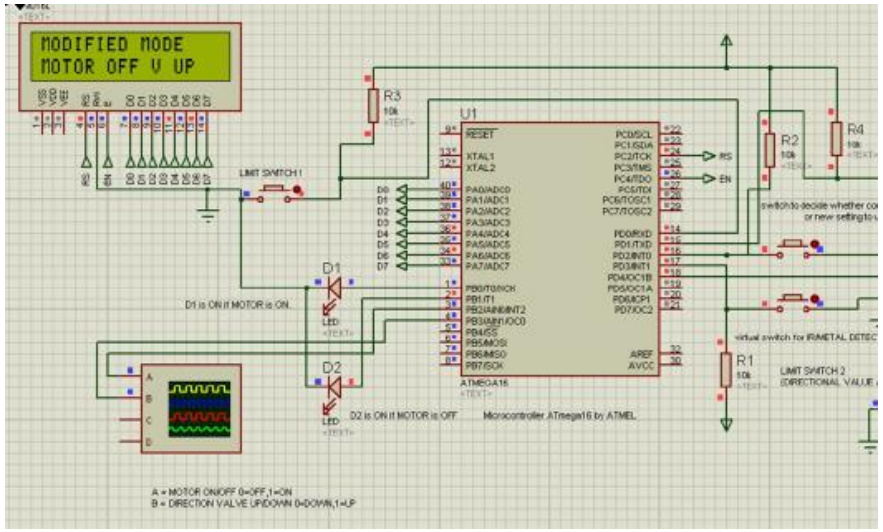
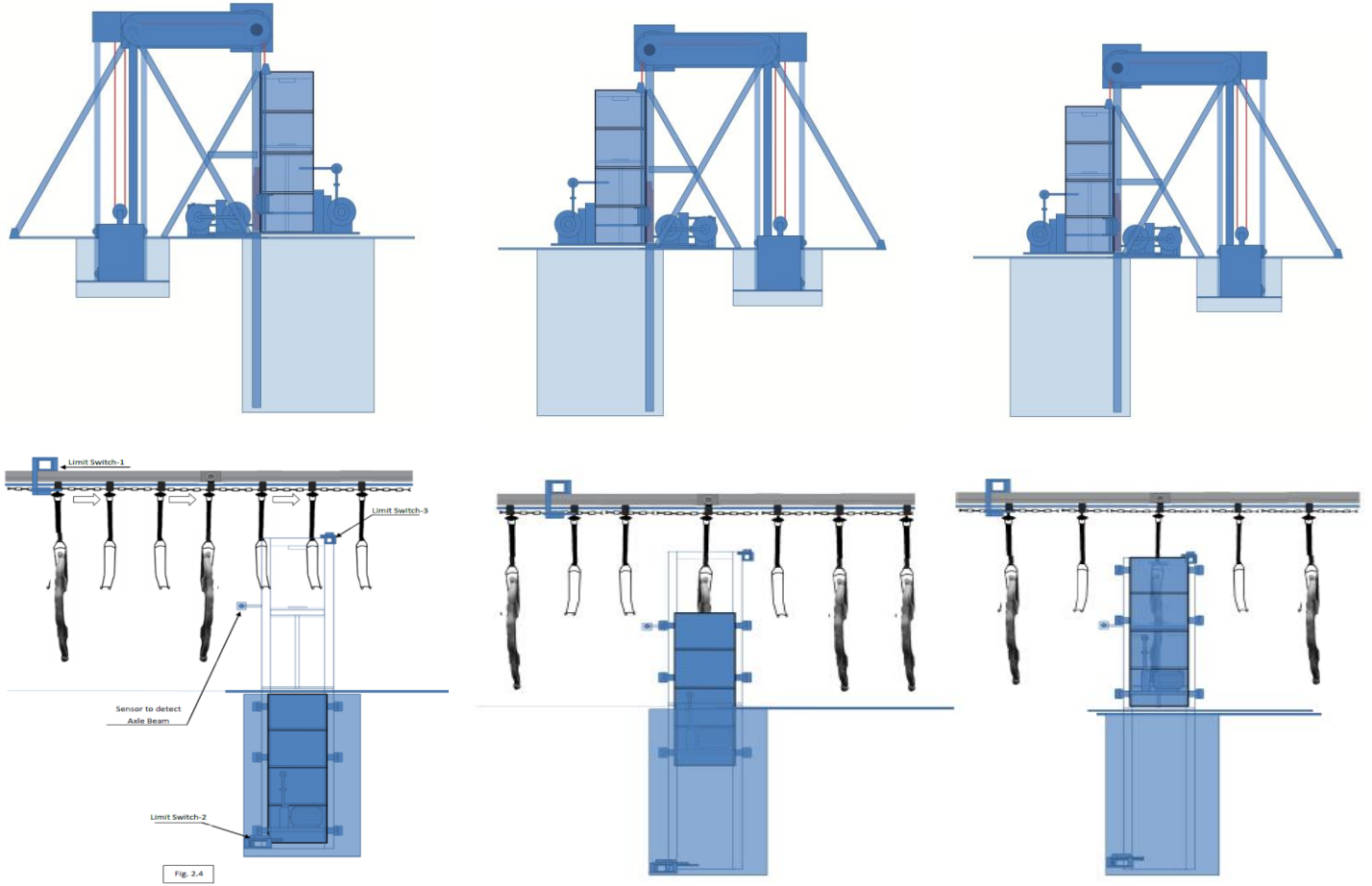
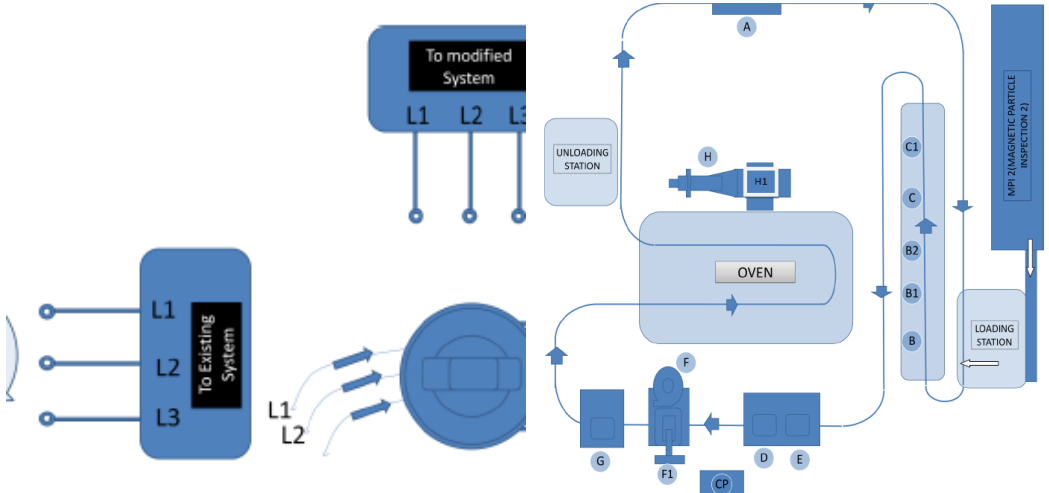
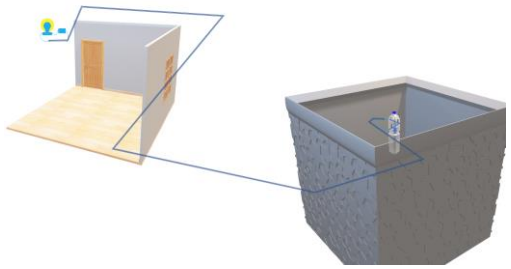



MODIFIED MODE
MOTOR OFF V UP
LIMIT SWITCH 1
D1 is ON if MOTOR is ON
D2 is ON if MOTOR is OFF
Microcontroller ATmega16 by ATMEL
LIMIT SWITCH 2
(DIRECTIONAL VALUE)
A = MOTOR ON/OFF 0=OFF,1=ON
B = DIRECTION VALVE UP/DOWN 0=DOWN,1=UP


Limit Switch-1
Limit Switch-3
Sensor to detect
Axle Beam
Limit Switch-2
Fig. 2.4


To modified System
L1
L2
L3
To Existing System
L1
L2
L3
UNLOADING STATION
OVEN
LOADING STATION
MPI 2(MAGNETIC PARTICLE INSPECTION 2)
A
B
B1
B2
C
C1
D
E
F
F1
G
H
H1
CP



2006

8th

Keshavraj Vidyalay Latur

10th

2008

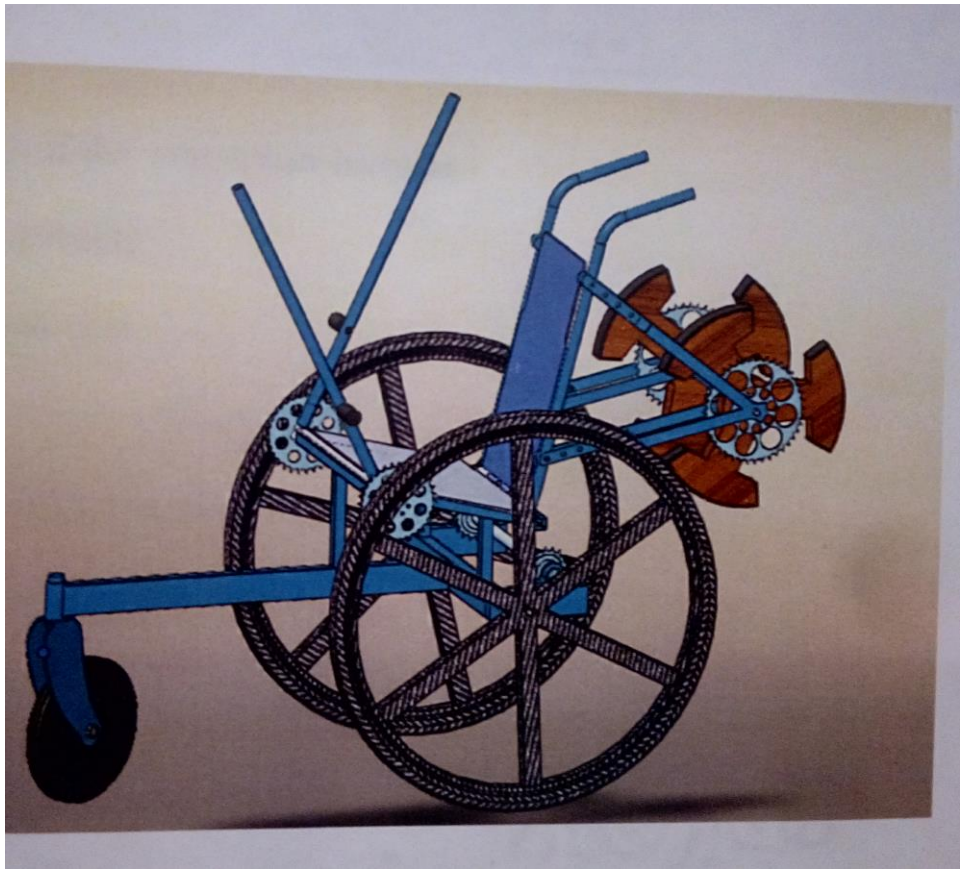
2010

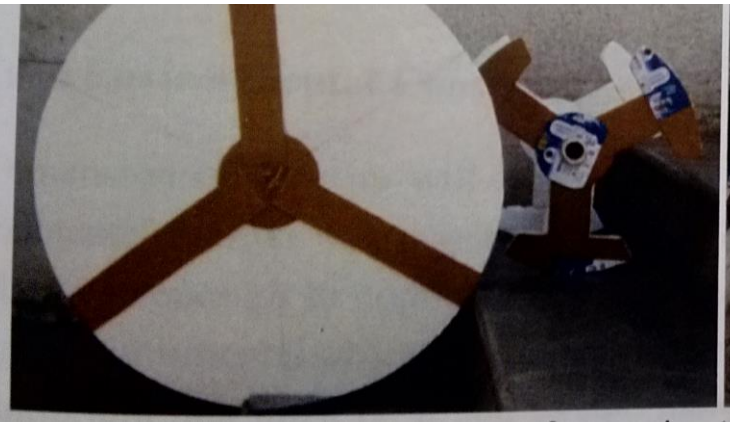
2012

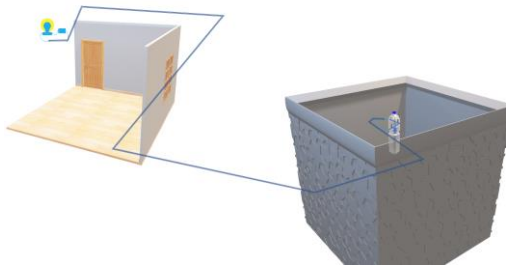
BE Mechanical Engineering, M. S. Bidve Engineering College Latur

2014

c
b
d
a
d = Diar
ESTRN
6.164e-004
5.651e-004
5.137e-004
3.596e-004
3.082e-004
2.569e-004
2.055e-004
1.541e-004
1.027e-004
5.137e-005
3.616e-009







10th

2006

2008

2010

2012

2014

8th

Keshavraj Vidyalay Latur

BE Mechanical Engineering, M. S. Bidve Engineering College Latur

LONG TERM प्रकल्प

Long Term = 12 वर्षांसाठी

आठवड्यातून एक तास one hour in a week

भूगोल

इतिहास

विज्ञान

भाषा

कला

खेळ

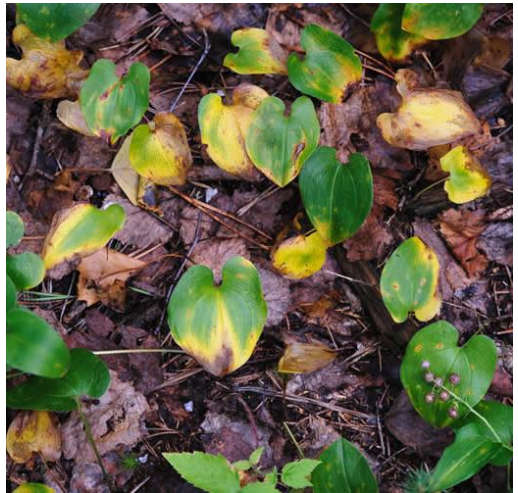
भूगोल

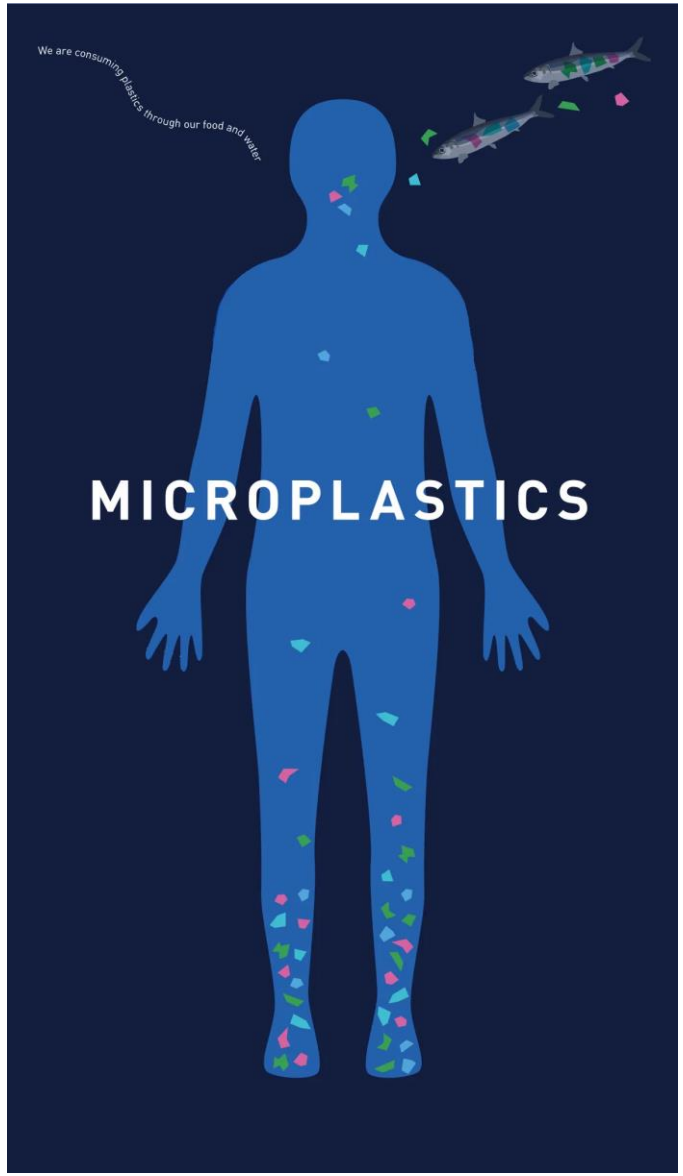
Geography

Long Term Project

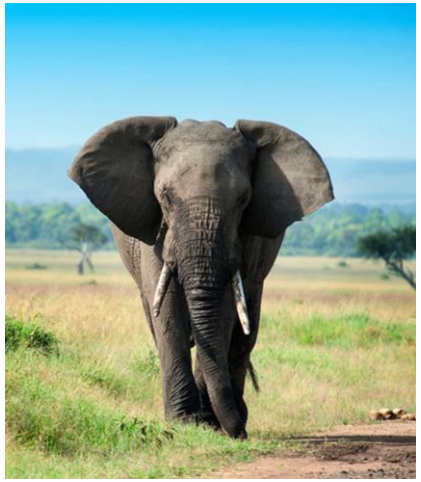
80%

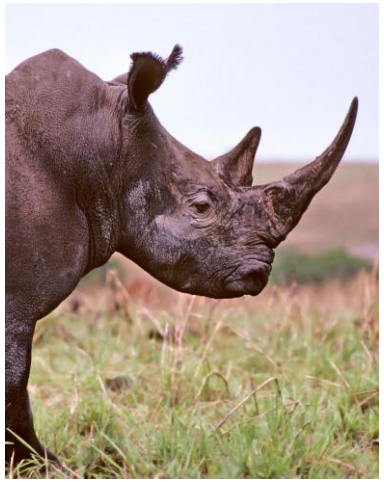
20%





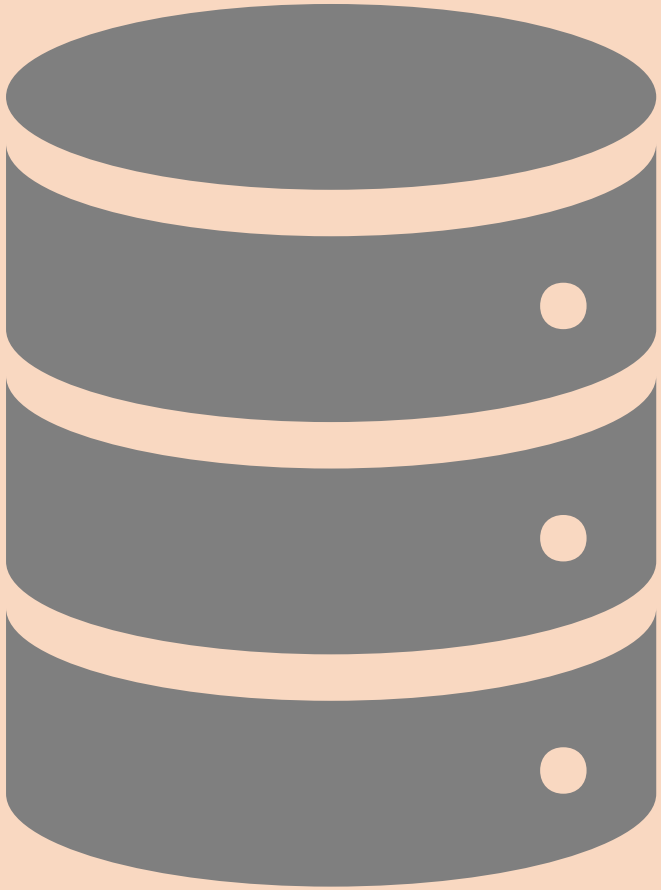
28gm ~ Weight of Credit Card





80%

20%

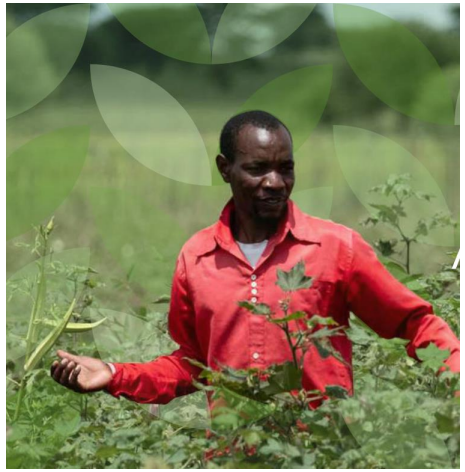


5x

10x

Fashion designer
Creative director
Apparel designer
Fashion designer
Fashion designer
Artimis
Fashion designer
UCMC
Apparel designer
Creative director
Fashion designer
Visual merchandizer
Fashion designer
Creative director
Apatani
Visual merchandizer
Tailor
Creative director
Designer
Visual merchandizer
Tailor
Visual merchandizer
Creative director
Visual merchandizer
Tailor
Creative director
Tailor
Visual merchandizer
Creative director
Fashion designer
Apparel designer
Fashion designer
Apparel designer
Creative director
Kanjivaram
Kasavu
Kalamkari
Ikat
Apatani
Apparel designer
Fashion designer
Apatani
Panchachauli
Pashmina
Kullu shawls
Phulkari
Visual merchandizer
Designer
Creative director
Creative director

Apparel Designer
Kanjivaram
Kasavu
Kalamkari
Ikat
Panchachauli
Pashmina
Kullu shawls
Phulkari
Kente Ankara
Dashiki
Apatani
Pithani
Chikankari
Sanganeri
Chanderi
Mashru



Fashion designer
Creative director
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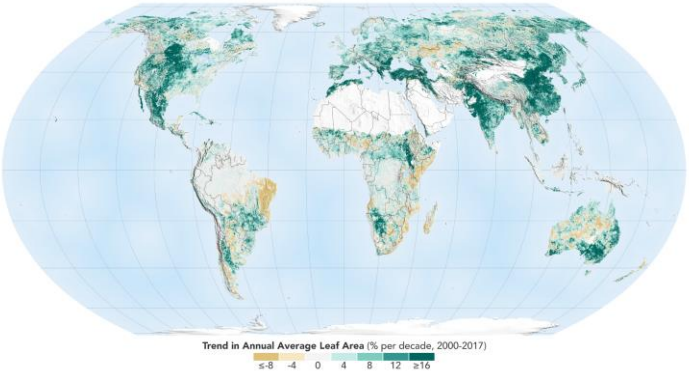
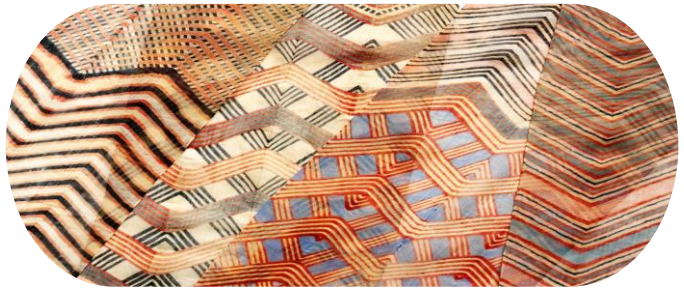

Trend in Annual Average Leaf Area (% per decade, 2000-2017)
≤-8 -4 0 4 8 12 ≥16



WHAT ARE THE DIFFERENT WEAVES THERE EXIST?

WHERE ARE THE HANDLOOM CLUSTERS?

CAN WE DOCUMENT THEM?

HOW MUCH OF THE POPULATION RELY ON NATURAL FIBER PRODUCTION AND SALES?

HOW TO CREATE TRENDS?

कौशल्ये
Skills

- Situational Awareness
- Sensor Fusion
- Sparse Information Modeling
- Systems Thinking

इतिहास

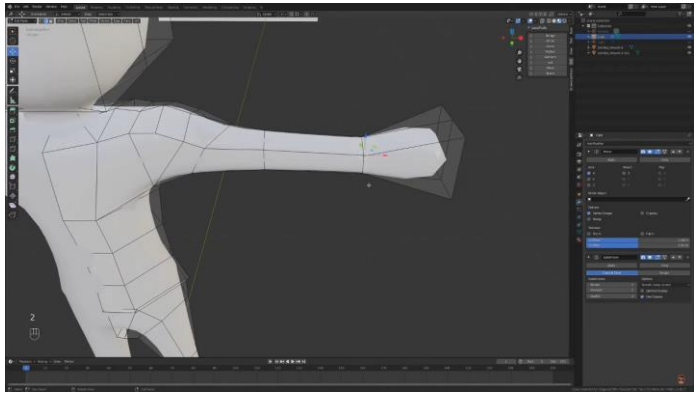
Itihasa

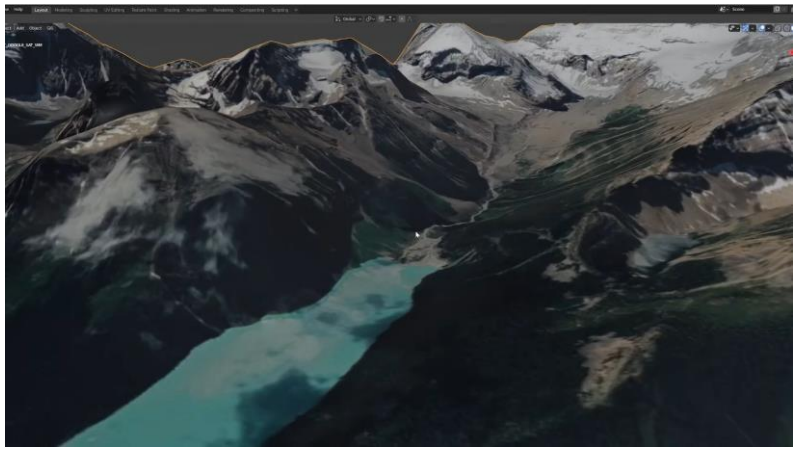
Long Term Project

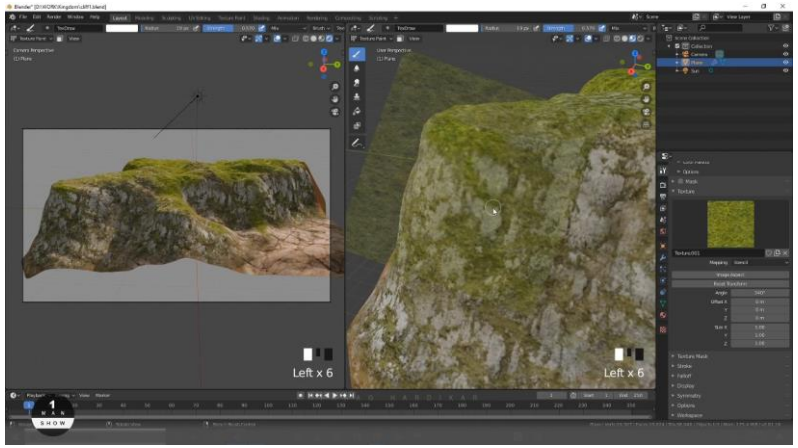
तुमचा आवडता व्हिडिओ गेम कोणता?

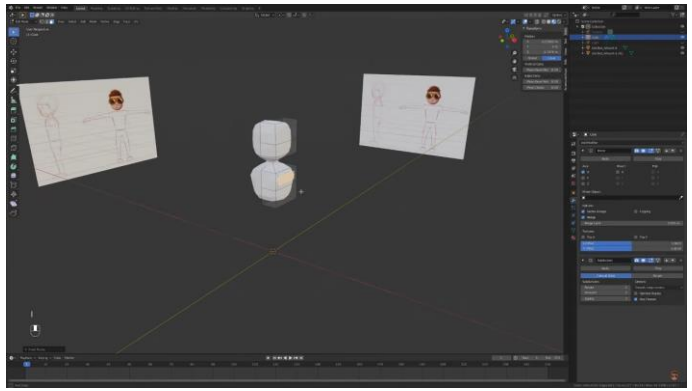
Your favorite video games?

व्हिडिओ गेम आणि ॲनिमेशन बनविण्यासाठी सोपी सॉफ्टवेअर उपलब्ध आहे









तुम्हाला चोला राजवंश माहित आहे का?

तंजावर येथील बृहदीश्वर मंदिर

Brihadisvara Temple at Thanjavur

चोलपुरम येथे गंगाईकोंडाचे मंदिर

the Temple of Gangaikonda Cholapuram

दारासुराम येथील
ऐरावतेश्वर मंदिर
the Airavatesvara Temple at Darasuram

हे अभियांत्रिकी चमत्कार करणारे राजे

the kings who built these engineering marvels

आम्ही नवीन तंत्रज्ञान वापरुन त्यांच्या कथा सांगू शकतो का?

can we tell their stories using new technologies?

त्यांना कोणत्या प्रकारच्या आव्हानांचा सामना करावा लागला?

what challenges they faced?

त्यांची मानसिकता काय होती?

what was their mindset?

त्यावेळी सामाजिक-राजकीय आणि आर्थिक वातावरण काय होते?

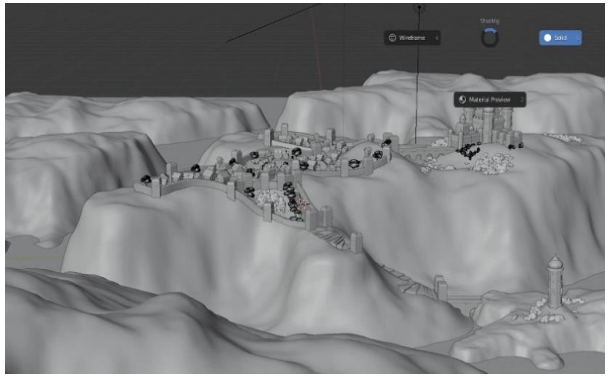
what were the socio-political and economic environments of that time?

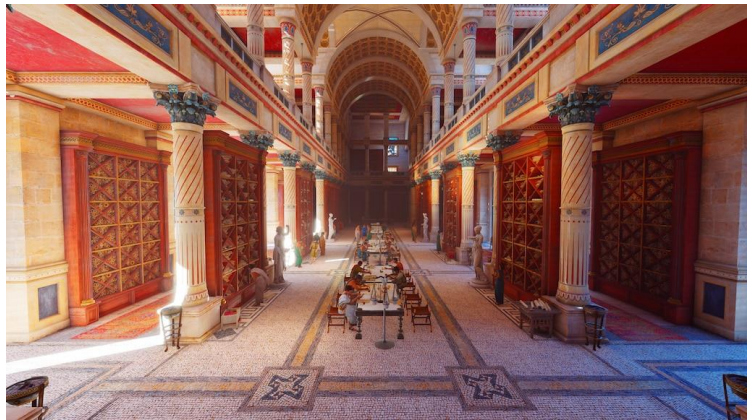
Before
After
NEXT TURN

Wireframe
Solid
Material Preview

गेम आणि ॲनिमेशन डेव्हलपमेंट टेक्नोलॉजीज

Game and Animation Development Technologies

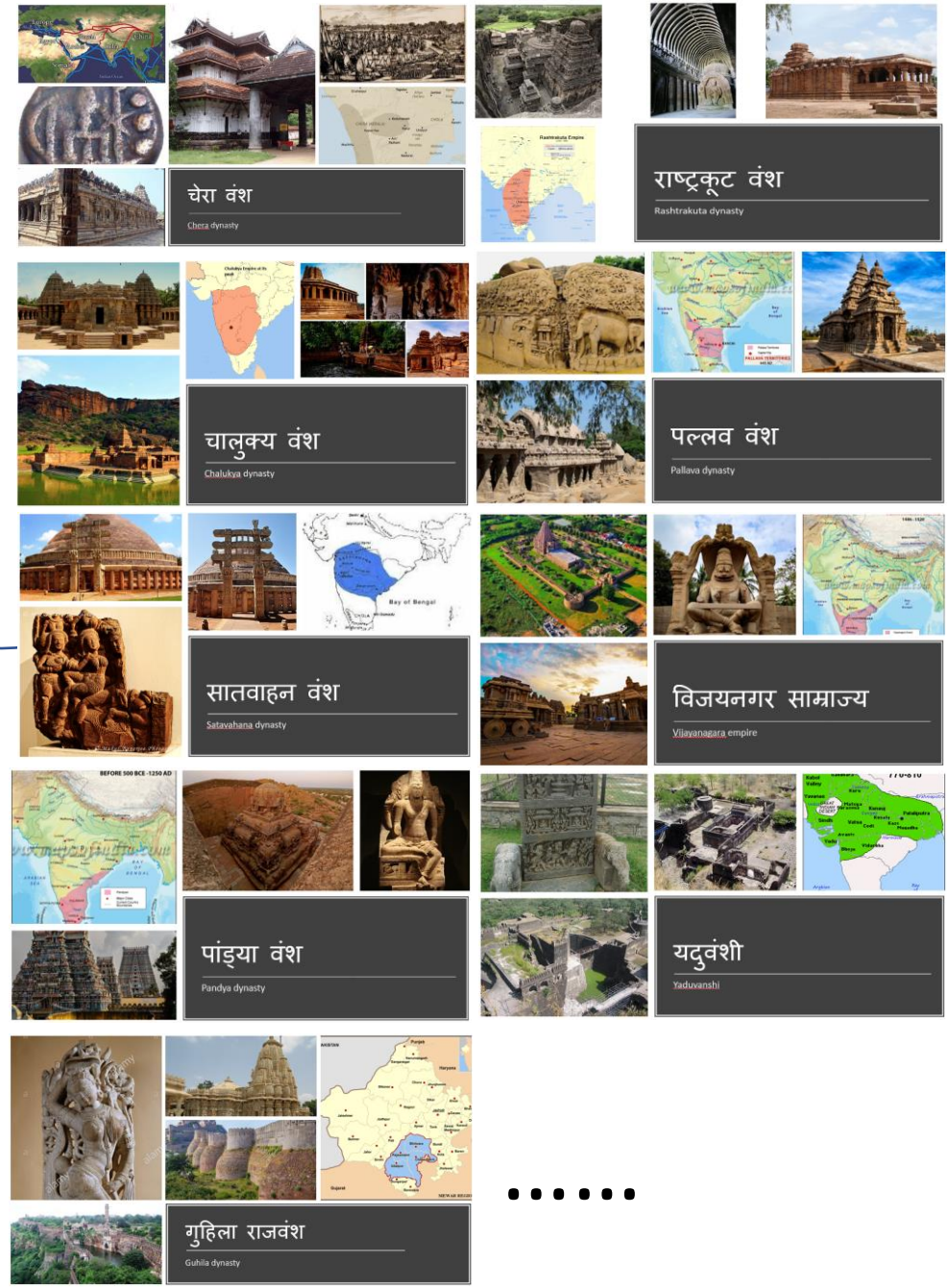




$$$

हजारो वर्षांचा इतिहास

Itihasa of Thousands of Years



.....

कौशल्ये
Skills

- Story telling
- Presentation
- Development
- Planning
- Decision Making
- Commercialization

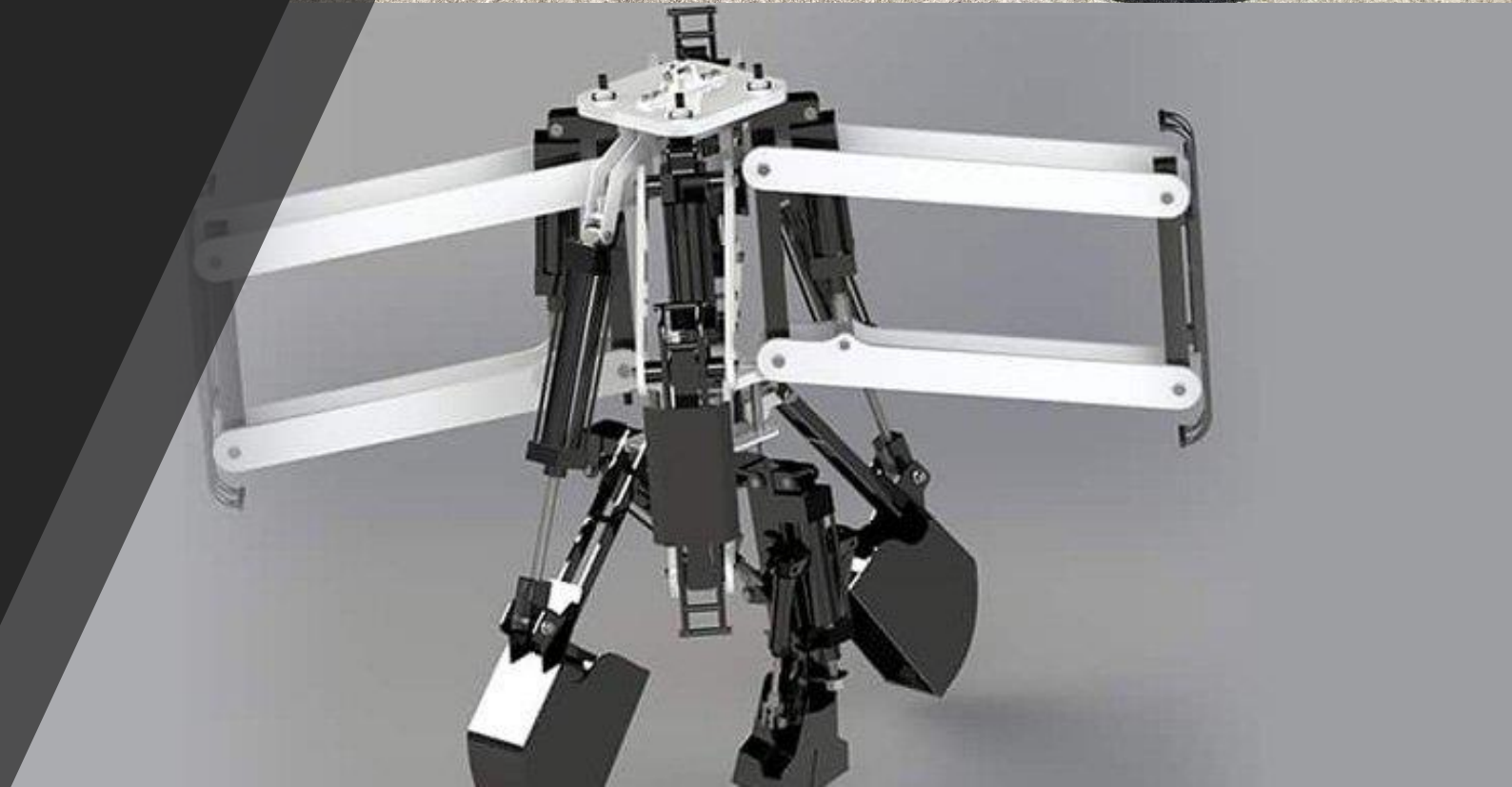
विज्ञान

Science

Long Term Project

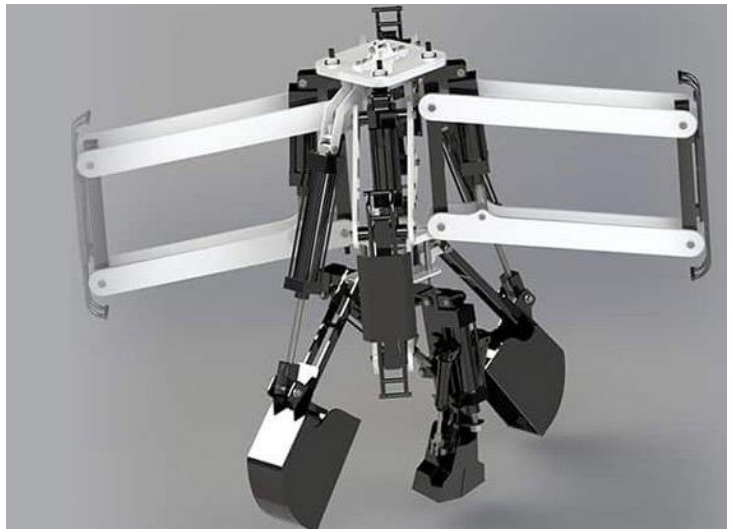
Robotics

- सामाजिक समस्या सोडवण्यासाठी
- for solving social problems



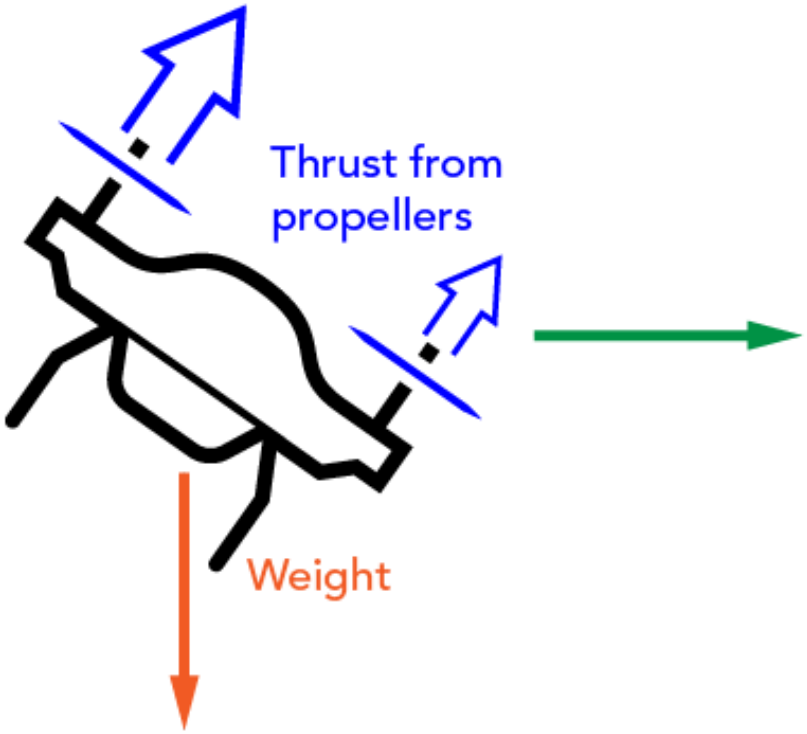
Robotics

- Cleaning
- Surveillance
- Agriculture
- Old age care



Robot

- Mathematics
- Physics
- Programming

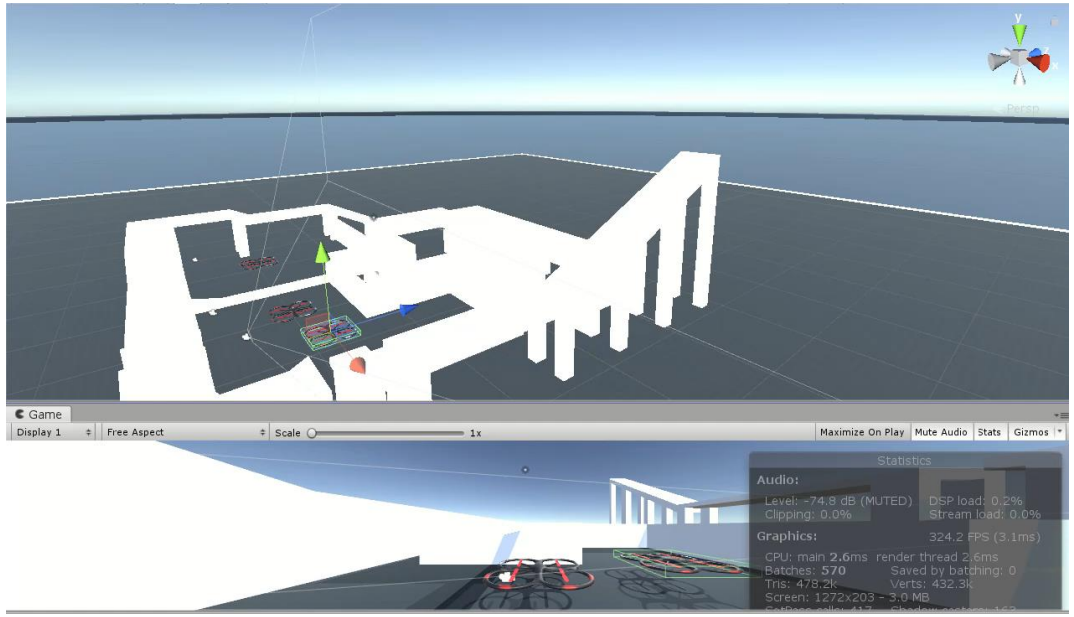


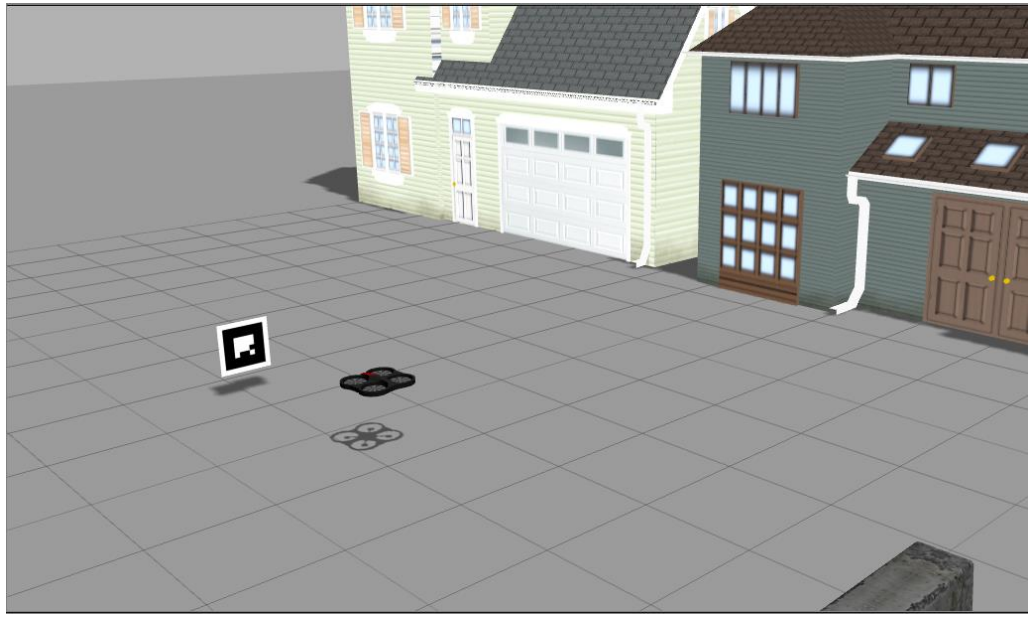
आपल्याकडे हार्डवेअर नाही

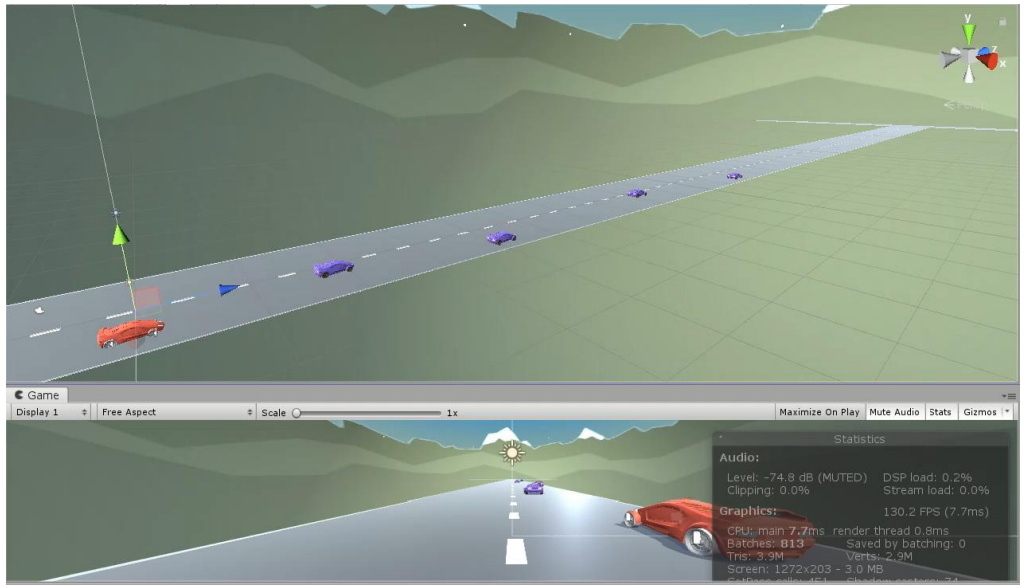
We don't have hardware

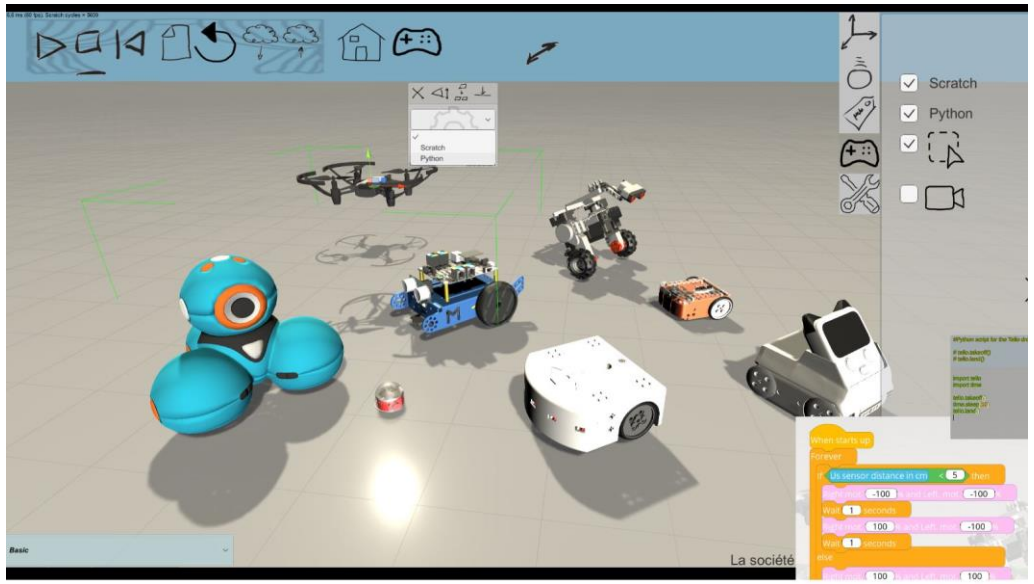
जर रोबोट तयार करणे शक्य नसेल तर आपण सिम्युलेशनमध्ये डिजिटल रोबोट्स बनवू शकतो का?

if we cannot make physical robots, can we make digital robots in simulation?


Game
Display 1
Free Aspect
Scale
1x
Maximize On Play
Mute Audio
Stats
Gizmos
Statistics
Audio:
Level: -74.8 dB (MUTED)
DSP load: 0.2%
Clipping: 0.0%
Stream load: 0.0%
Graphics:
324.2 FPS (3.1ms)
CPU: main 2.6ms render thread 2.6ms
Batches: 570
Saved by batching: 0
Tris: 478.2k
Verts: 432.3k
Screen: 1272x203 - 3.0 MB




Game
Display 1
Free Aspect
Scale
1x
Maximize On Play
Mute Audio
Stats
Gizmos
Statistics
Audio:
Level: -74.8 dB (MUTED)
DSP load: 0.2%
Clipping: 0.0%
Stream load: 0.0%
Graphics:
130.2 FPS (7.7ms)
CPU: main 7.7ms render thread 0.8ms
Batches: 813
Saved by batching: 0
Tris: 3.9M
Verts: 2.9M
Screen: 1272x203 - 3.0 MB


Scratch
Python
La société

कौशल्ये
Skills

- Simulation
- Experimentation
- Economy
- Decision Theory
- Strategy

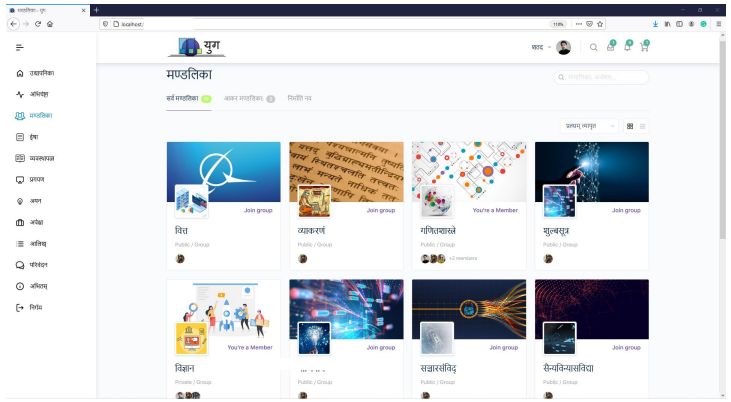
भाषा

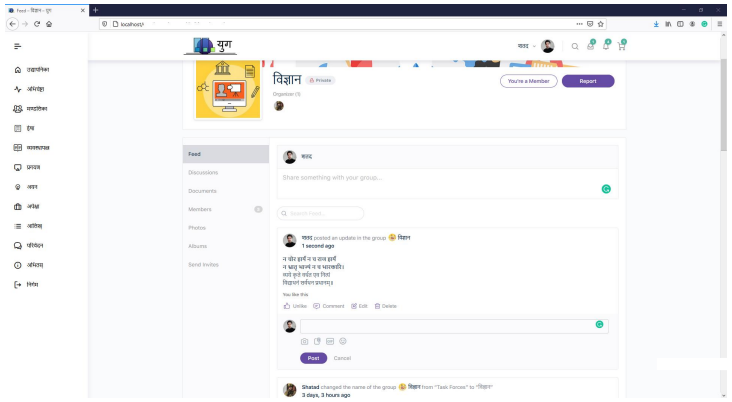
Language

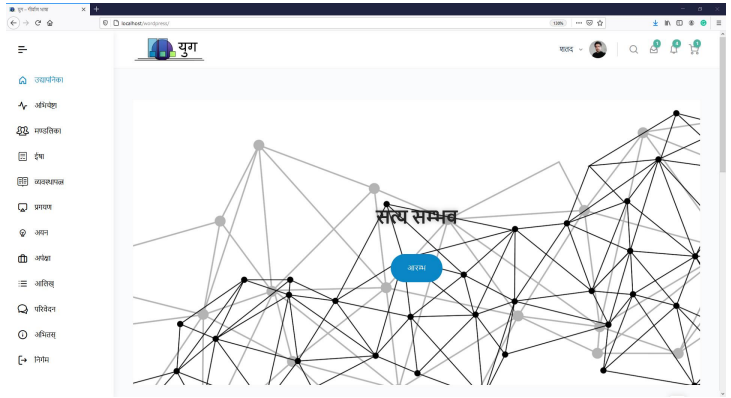
Long Term Project

आपण सोशल नेटवर्क प्लॅटफॉर्मवर आहात का?

are you on social network platforms?


युग
मण्डलिका
वित्त
व्याकरणं
गणितशास्त्रे
मूल्यसूत्र
विज्ञान
सङ्ख्यासंविद्
सैन्यनिर्माणविद्या


युग
विज्ञान


युग
सत्य सम्भव
आरम्भ

संस्कृतम्

आपण जगातील पहिले संस्कृत सोशल नेटवर्क प्लॅटफॉर्म बनवू शकतो का?

can we make world's first Sanskrit social network platform

युग – गीर्वाण भाषा

localhost/ 130%

युग

शतद

- उद्यापनिका
- अभिचेष्टा
- मण्डलिका
- ईषा
- व्यवस्थापत्र
- प्रगयण
- अयन
- अपेक्षा
- आलिख्
- परिवेदन
- अभितस्
- निगम

सत्य सम्भव

आरम्भ

मण्डलिका - युग

localhost/

110%

युग

शतद

- उद्यापनिका
- अभिचेष्टा
- मण्डलिका
- ईषा
- व्यवस्थापत्र
- प्रगयण
- अयन
- अपेक्षा
- आलिख्
- परिवेदन
- अभितस्
- निर्गम

मण्डलिका

मण्डलिका: अन्वेषण...

सर्व मण्डलिका 12 | आकर मण्डलिका: 2 | निर्मिति नव

प्रत्यग्रम् व्यापृत

Join group

वित्त

Public / Group

Join group

व्याकरणं

Public / Group

You're a Member

गणितशास्त्रे

Public / Group

+2 members

Join group

शुल्बसूत्र

Public / Group

You're a Member

विज्ञान

Private / Group

Join group

पाणिनीय

Public / Group

Join group

सञ्चारसंविद्

Public / Group

Join group

सैन्यविन्यासविद्या

Public / Group

Feed – विज्ञान – युग

localhost/

युग

शतद

उद्यापनेका

अभिचेष्टा

मण्डलिका

इषा

व्यवस्थापत्र

प्रगयण

अयन

अपेक्षा

आलिख्

परिवेदन

अभितस्

निगम

विज्ञान

Private

You're a Member

Report

Organizer (1)

Feed

Discussions

Documents

Members 3

Photos

Albums

Send Invites

शतद

Share something with your group...

Search Feed...

शतद posted an update in the group विज्ञान

1 second ago

न चोर हार्यं न च राज हार्यं
न भ्रातृ भाज्यं न च भारकारि।
व्यये कृते वर्धत एव नित्यं
विद्याधनं सर्वधन प्रधानम्॥

You like this

Unlike Comment Edit Delete

Post Cancel

Shatad changed the name of the group विज्ञान from "Task Forces" to "विज्ञान"

3 days, 3 hours ago

कौशल्ये
Skills

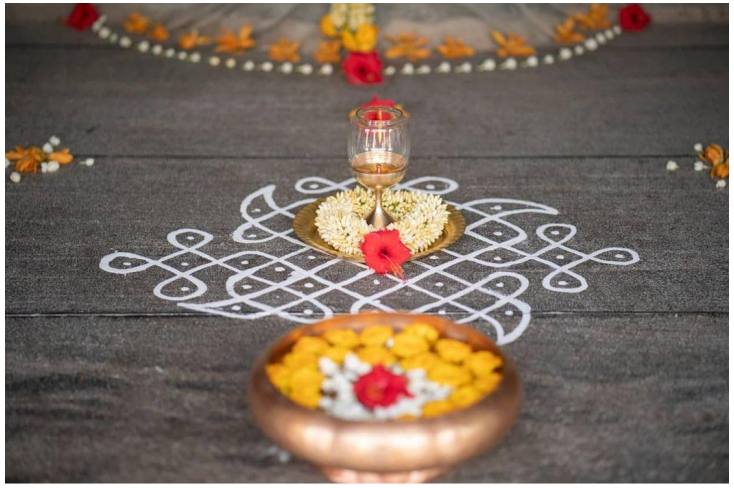
- Computation
- Analysis
- Articulation
- Marketing
- Sales
- Security

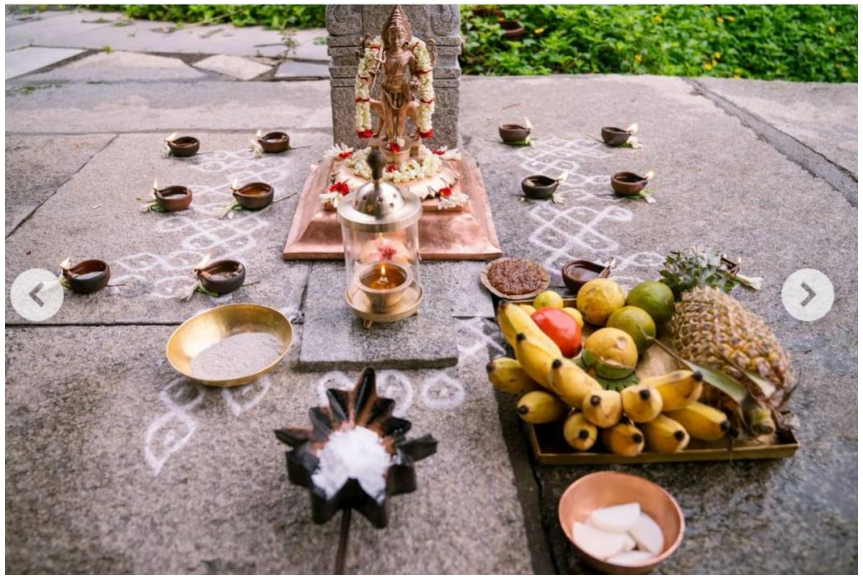
कला

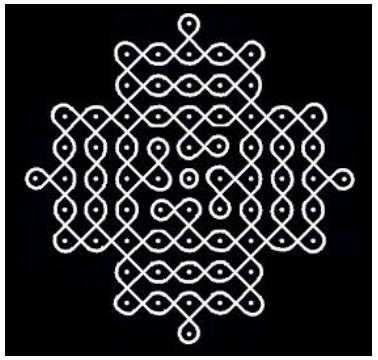
Art

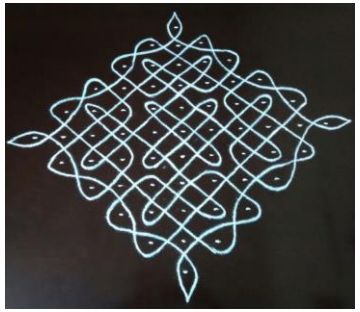
Long Term Project

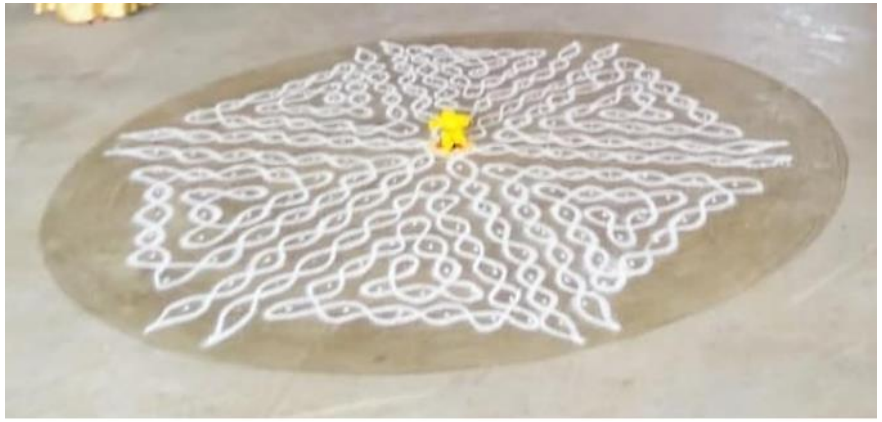
कोल्लम् Kolam கோலம் ముగ్గు

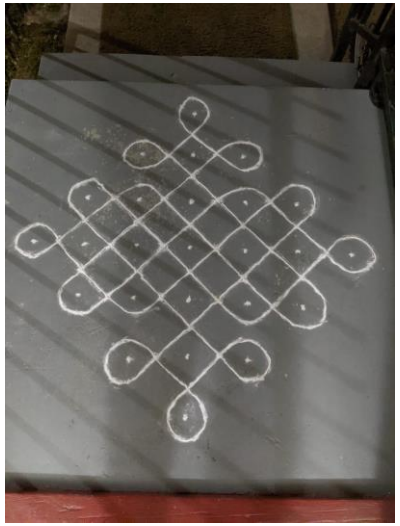












कोल्लम्
Kolam

तांदळाचे पीठ rice flour

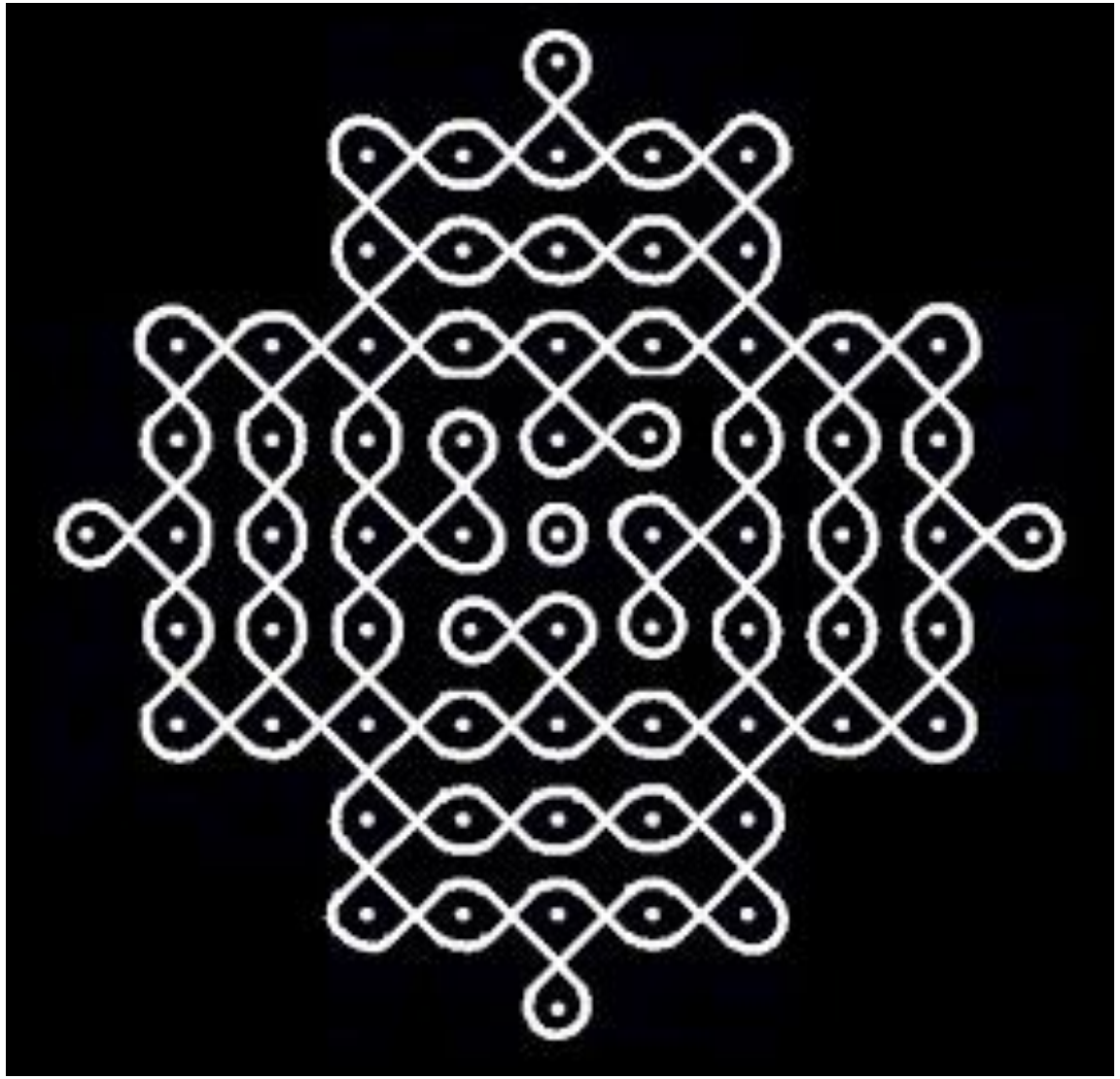
गणिती Mathematical patterns

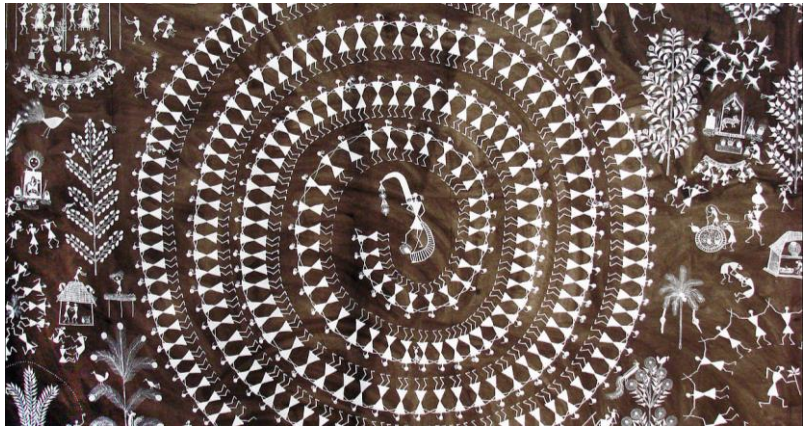
प्रत्येक डिझाइनचा वेगळा अर्थ असतो Each design has a different meaning

वेगवेगळ्या प्रसंगांसाठी भिन्न डिझाईन्स Different designs for different occasions

कोल्लम् Kolam

- बऱ्याच लोकांना याबद्दल माहिती नसते परंतु शिकण्यास रस असतो Many people don’t know about it but interested in learning
- काही लोकांना याबद्दल माहिती आहे Some people know about it
- आम्ही ते दस्तऐवजीकरण करू शकतो? आणि आम्ही लोकांना कनेक्ट करू शकतो? Can we document it? And can we connect people?



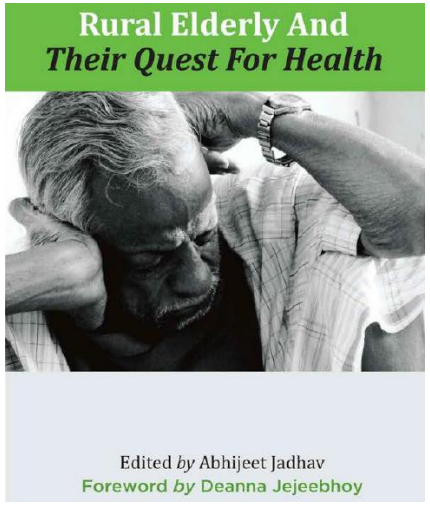


अनेक कला कालावकाश होत आहेत

many artforms are dying

जुन्या कला आणि नवीन पिढी यांच्यातील दुवा ग्रामीण वडीलधा.्यांचा आहे

rural elderlies are the link between old arts and new generation



$$$

गायब होणा कलांविषयी माहिती असलेले लोक वृद्ध आहेत आणि ग्रामीण भागात राहतात People who know about dying arts are old and live in rural parts

हे लोक आहेत ज्यानच्याकडे सामाजिक लक्ष देण्याची आवश्यकता आहे These are the same people who need societal attentions

यासारख्या प्रणाल्यांचे व्यापारीकरण करता येईल का? Can the Systems like these be commercialized

भांडवल उभारणे आणि गरजू लोकांना मदत करणे to raise capital and help needy

कौशल्ये
Skills

- Communication
- Culture
- Data analysis
- Stakeholder Need Analysis
- Value Networks

खेळ

Sports

Long Term Project

ओळख identities

Describe yourselves

- Occupation
- Religion
- Cast
- Race
- Skin color
- Region
- Money

मर्यादित ओळखीच्या पलीकडे जाण्याचे साधन म्हणून खेळ

Sports as a means to go beyond limited identities

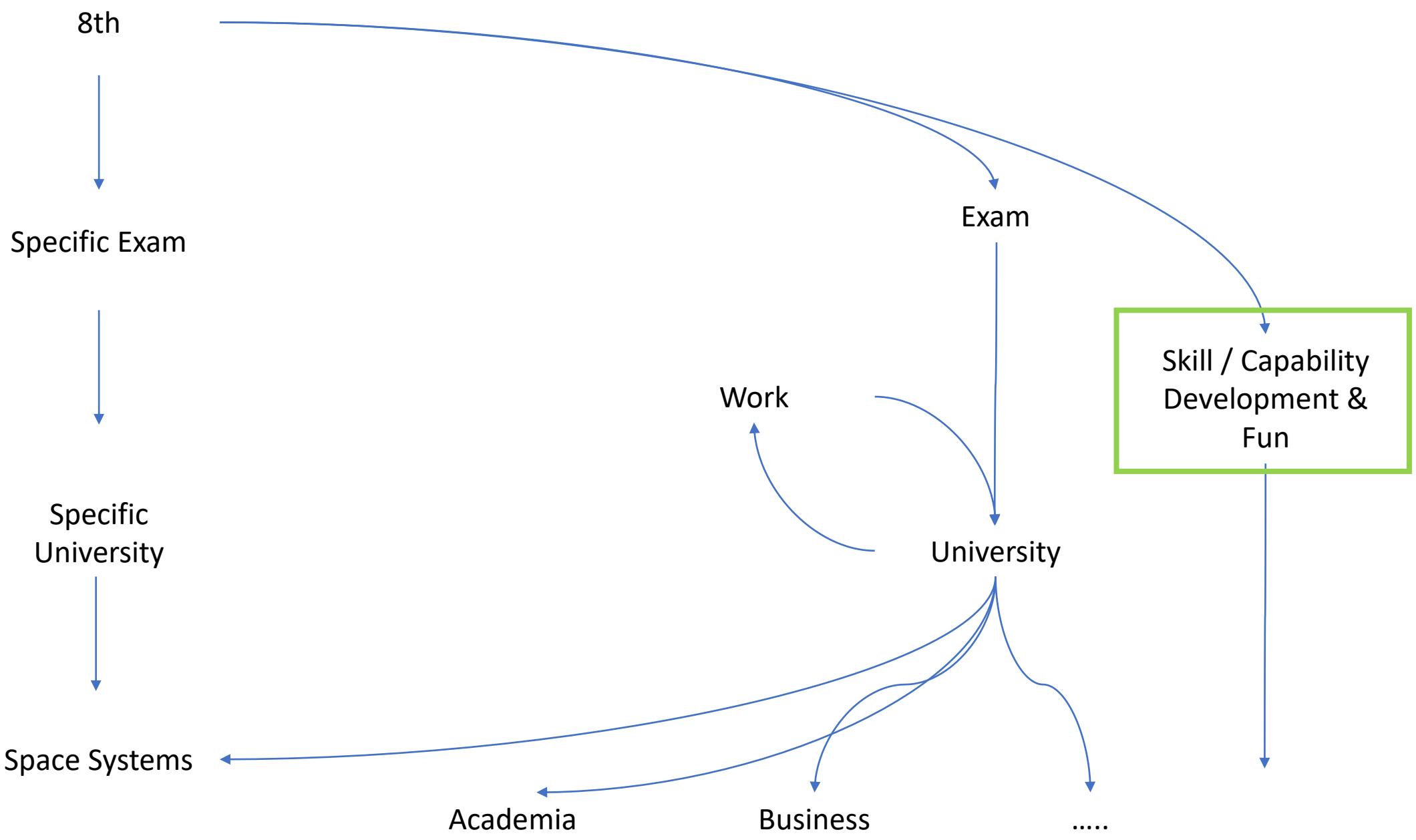
खेळाडू Player

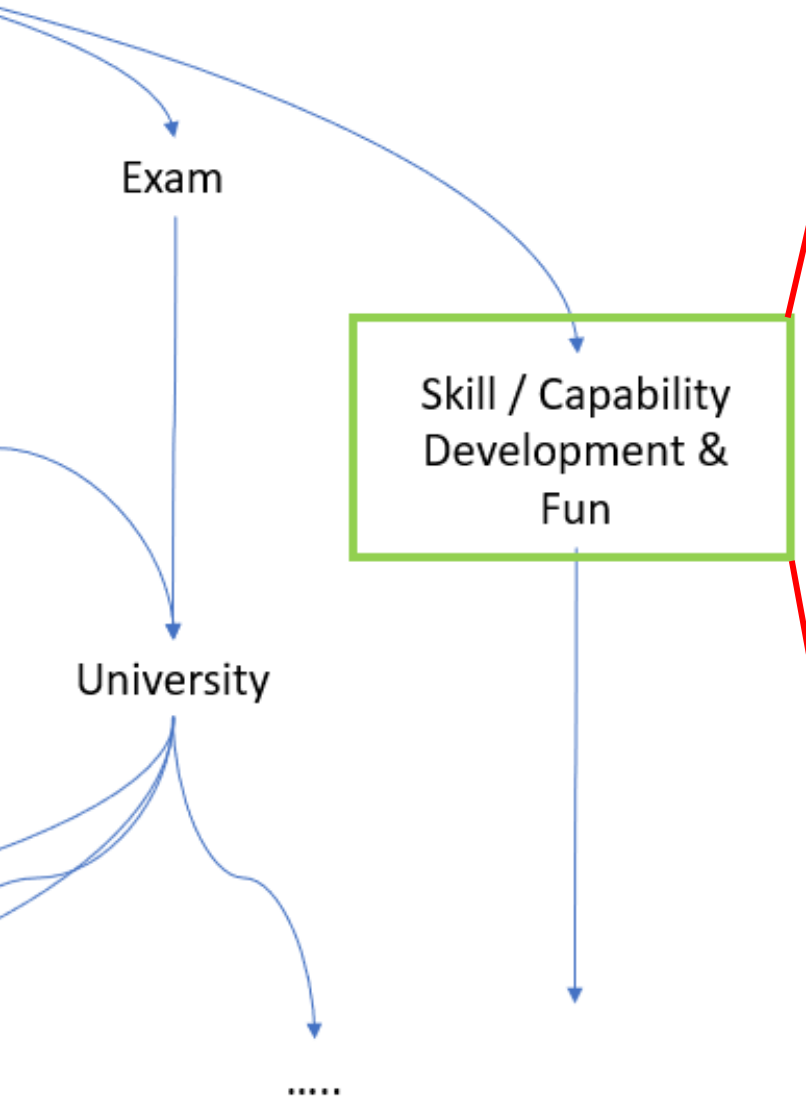
मैदानी खेळांना कसे प्रोत्साहन द्यावे
How to promote outdoor games

- प्रत्येक ठिकाणी कॅमेरे Cameras every where
- कार्यक्रम व्यवस्थापन Event management
- समन्वयित प्रसारण Coordinated Broadcasting

कौशल्ये
Skills

- Project management
- Conflict Resolution
- Digitization
- Coordination
- Scheduling


8th
Specific Exam
Specific University
Space Systems
Exam
Work
University
Skill / Capability Development & Fun
Academia
Business
.....



कौशल्ये Skills

- Communication
- Culture
- Data analysis
- Stakeholder Need Analysis
- Value Networks

कौशल्ये Skills

- Computation
- Analysis
- Articulation
- Marketing
- Sales
- Security

कौशल्ये Skills

- Project management
- Conflict Resolution
- Digitization
- Coordination
- Scheduling

कौशल्ये Skills

- Situational Awareness
- Sensor Fusion
- Sparse Information Modeling
- Systems Thinking

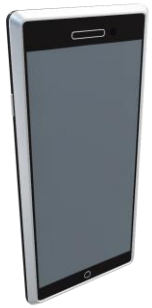
कौशल्ये Skills

- Story telling
- Presentation
- Development
- Planning
- Decision Making
- Commercialization

कौशल्ये Skills

- Simulation
- Experimentation
- Economy
- Decision Theory
- Strategy

माहिती वापर Content Consumption → मूल्य निर्मिती Value Creation



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