Digital Twin for Design Education and Research in KAIST

PRAGMA 36 at Jeju

2019-04-25

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Contents

- KAIST
- Computational Design Center of EDISON program of Korea Government
- iCAD Laboratory of KAIST
- Ongoing digital twin studies inside iCAD lab.

KAIST Statistics

Enrollment (as of Feb. 2019)
10,289

Undergraduate **4,051** | Graduate **2,691**
Joint M.S./Ph.D. **925** | Ph.D. **2,622**

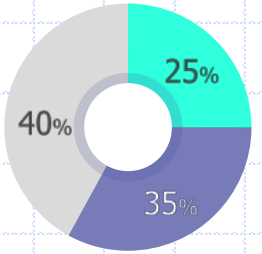
Degrees Conferred (as of Feb. 2019)
63,830

B.S. **18,018**
M.S. **32,783** | Ph.D. **13,029**

Faculty & Staff (as of Feb. 2019)
1,132

Faculty **631**
Staff **501**

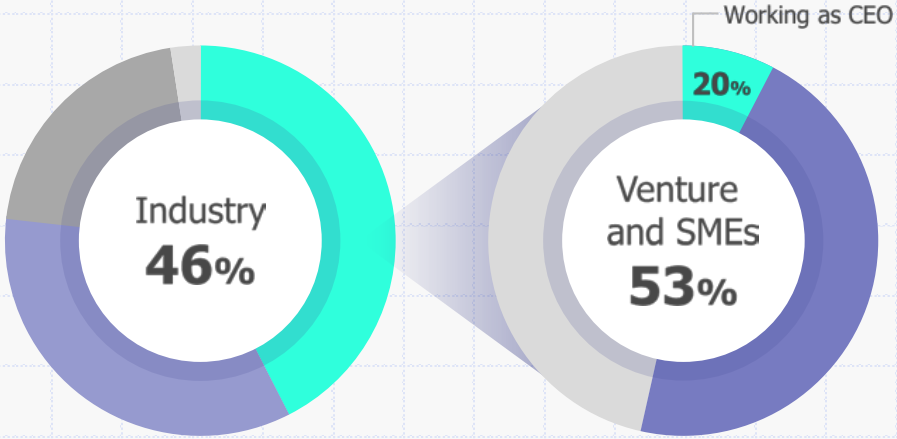
Budget (as of 2019)
765 Million USD



Research Grants | Other Income (Donation, etc) | Government Subsidy

THOMSON REUTERS	**11th**	2018 The World's Most Innovative Universities
THOMSON REUTERS	**1st**	2016, 2017, 2018 Asia's Most Innovative Universities
QS	**40th**	2018 QS World University Rankings
SAMSUNG	Nearly **25%**	of Samsung's R&D workforce are KAIST graduates
Professorship	Nearly **20%**	of all Korean universities' engineering faculty are KAIST graduates

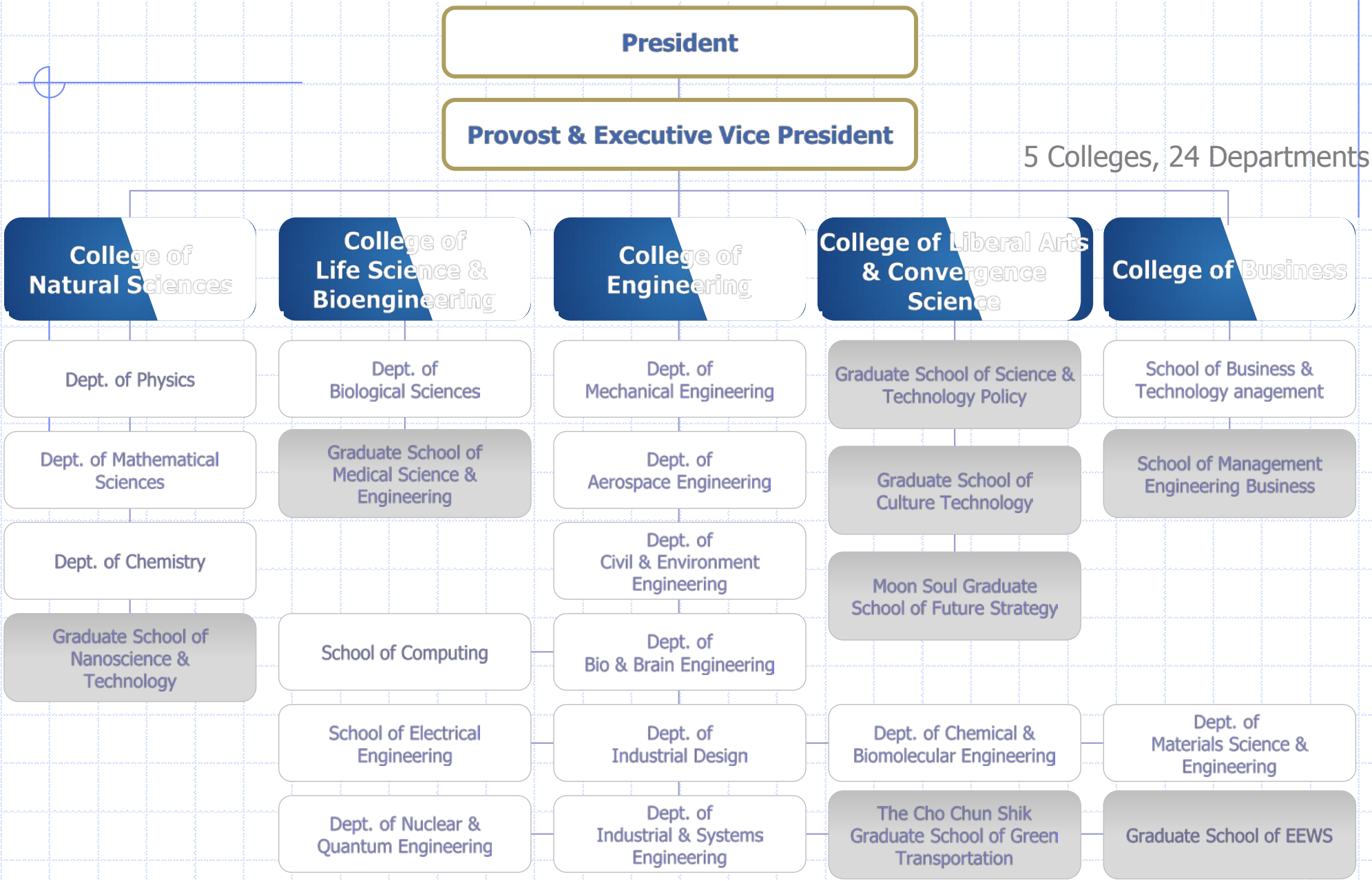
Career Status of Ph.D. Graduates (as of Aug. 2018)



- University Faculty : **27.2%**
- Government and Public Institution : **18.9%**
- Overseas Residence : **3%**

Belong to SMEs and Venture 1700 persons

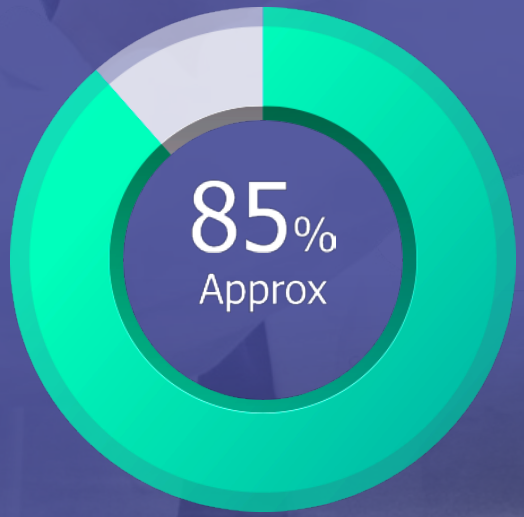
Academic Organization



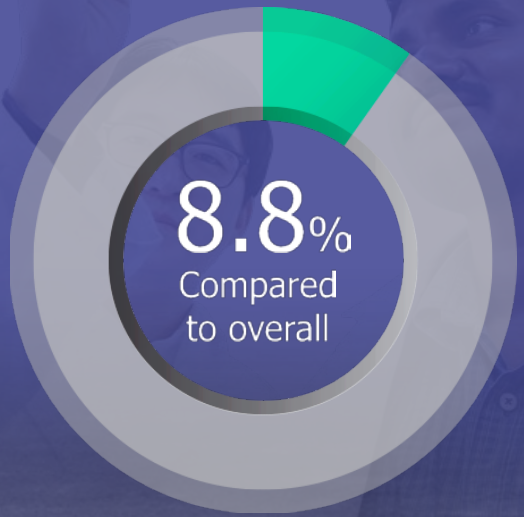
Globalization

Building up a Global Campus

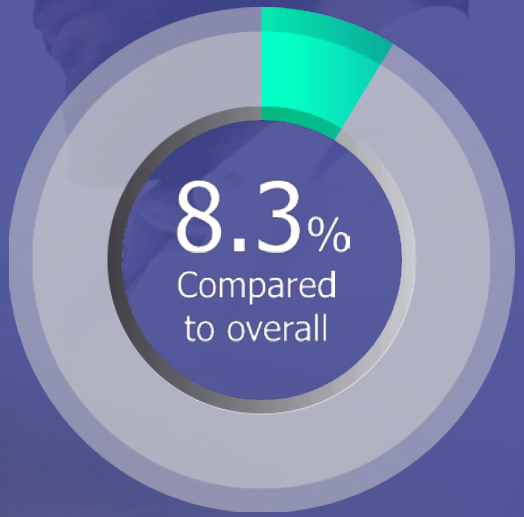
Ratio of conducting
class in English
(2014~2017)

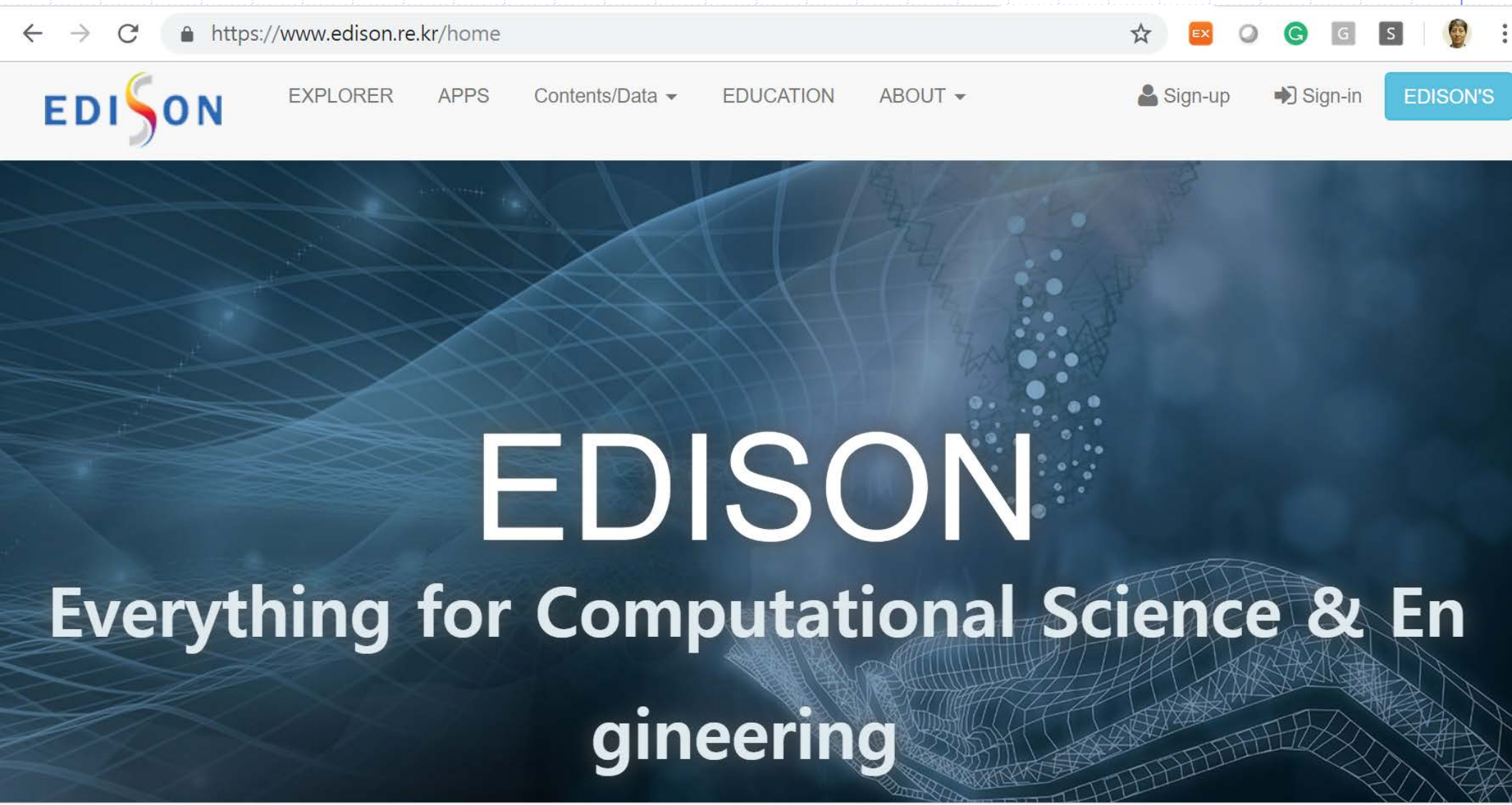


915 persons
from 92 countries
International students body



52 persons from
12 countries
International faculty members

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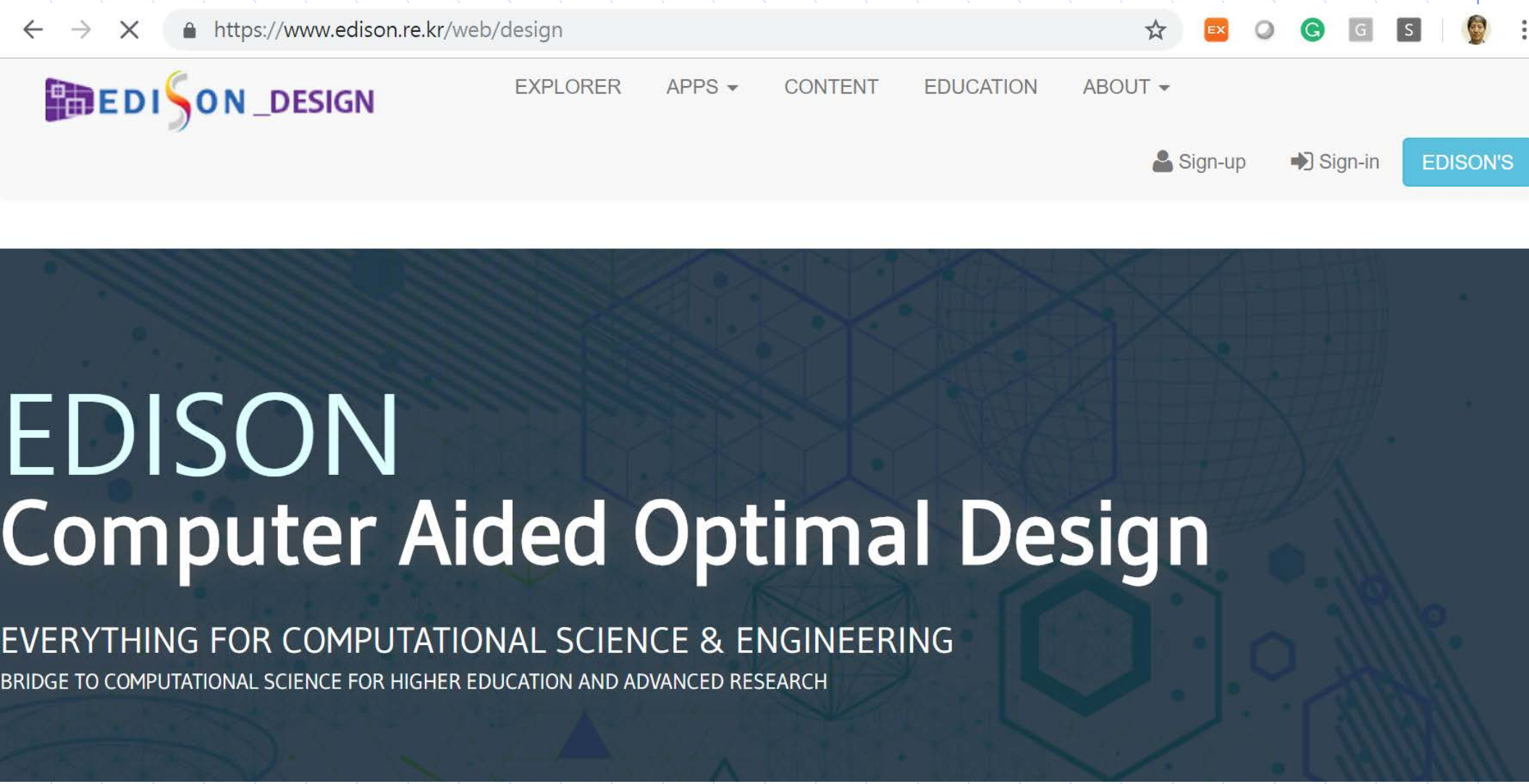
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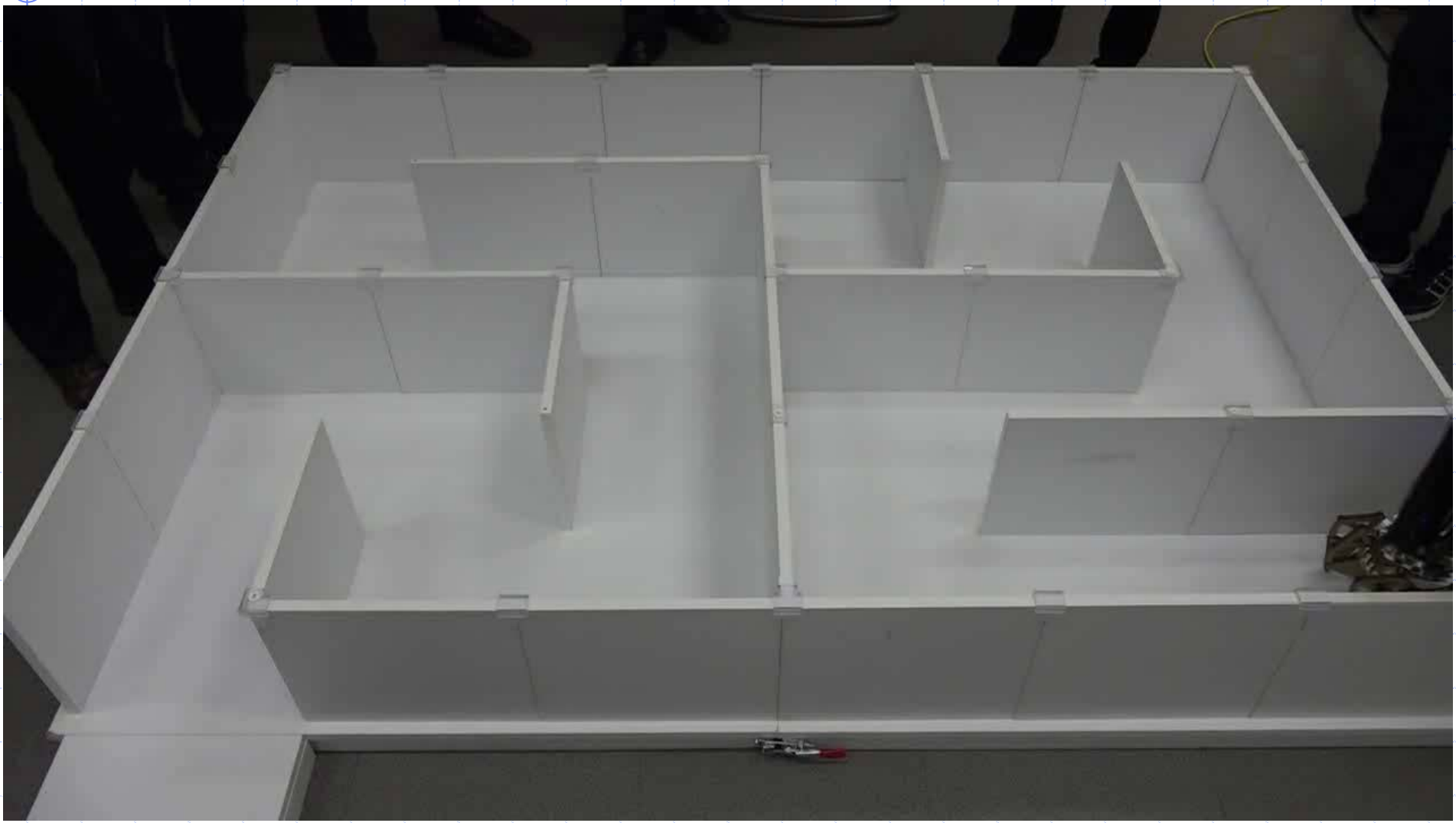
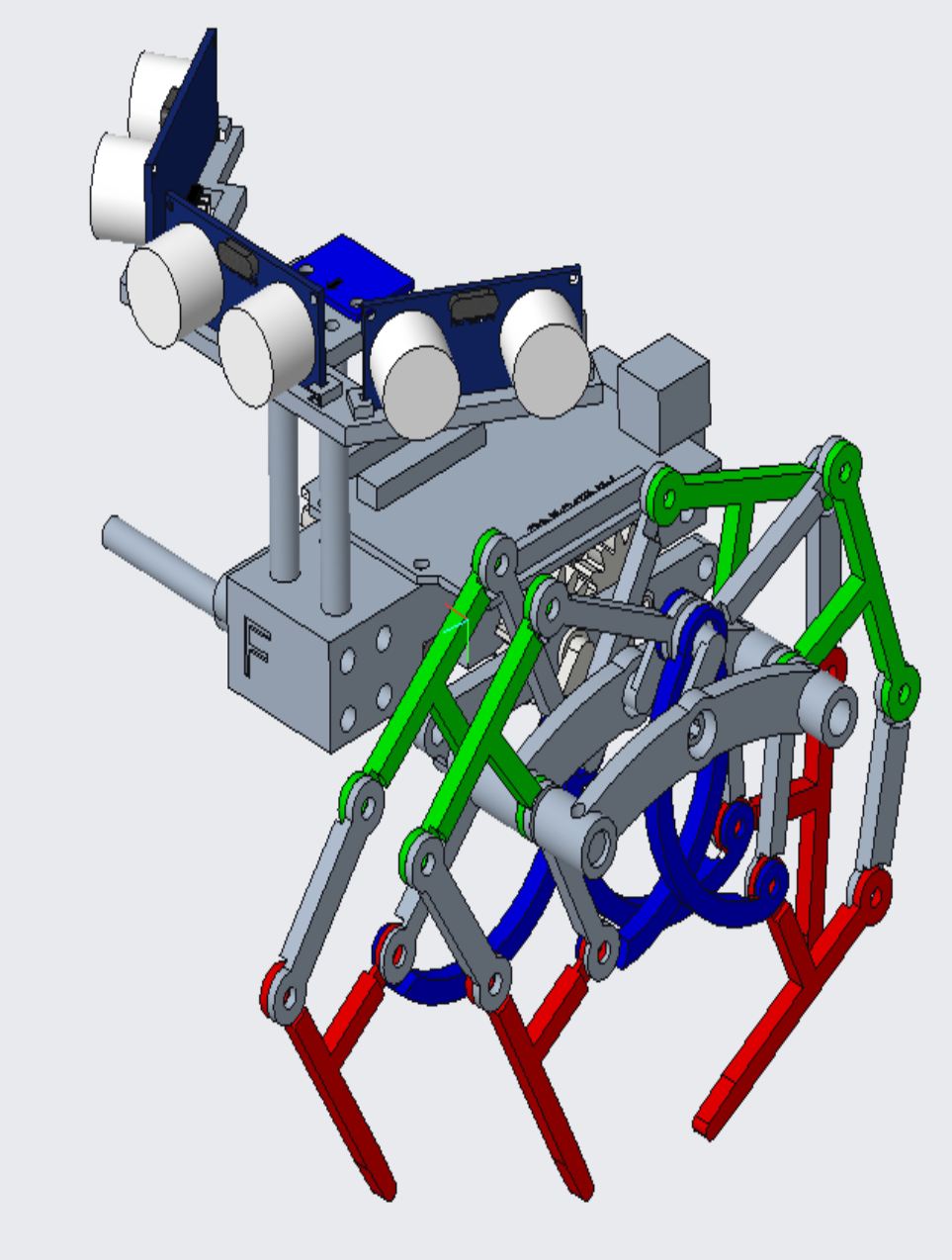
Computer Aided Optimal Design
EVERYTHING FOR COMPUTATIONAL SCIENCE & ENGINEERING
BRIDGE TO COMPUTATIONAL SCIENCE FOR HIGHER EDUCATION AND ADVANCED RESEARCH

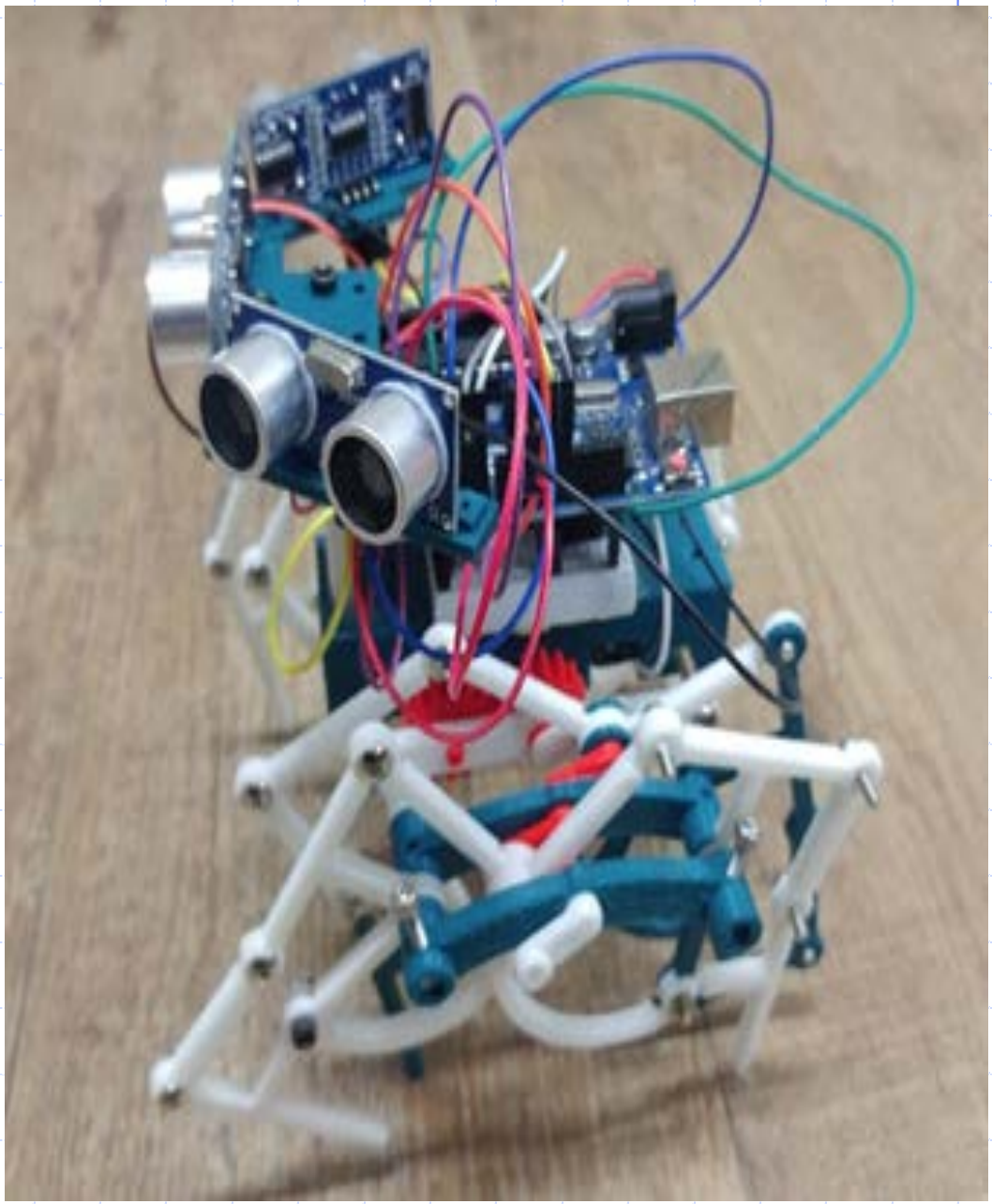
Contest with Jansen mechanism (2018.2)



https://youtu.be/2SMmY0cXk5k

Contest with Jansen mechanism





https://www.youtube.com/watch?v=gaITPWDKiXk

TV broadcasting (2017.03)

https://youtu.be/Ixrx-mTDLxk

https://sites.google.com/site/icadlaboratory/researches

iCAD Laboratory

탐색

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- About Us
  - Prof.Soonhung Han
  - Members
- Projects Ongoing
  - 플랜트 협업 지원 라이브러리 기술 개발
  - 첨단 사이언스 · 교육 허브 개발 사업(EDISON)
  - 부유식 해양 풍력 시스템 개발
  - 복합형 수동제어 로터 개발 및 실증
  - 3D 스캐닝 기반 플랜트 엔지니어링 응용지원 솔루션 및 활용기술 개발
  - 경량3D모델기반 디지털협업 지원 시스템 개발
  - 수중근접폭발 특화 연구실
- Projects Deliverable

Research Topic

Research of iCAD Laboratory focuses on the exchange of CAD models among different CAD systems. Companies spend huge cost in pursu
laboratory focuses on solving this problem by implementing methods which enable design model exchange based on the ISO standard STEF
the Macro-Parametrics Approach (MPA). The MPA method uses the macro file, which is a set of modeling commands of a commercial CAD s

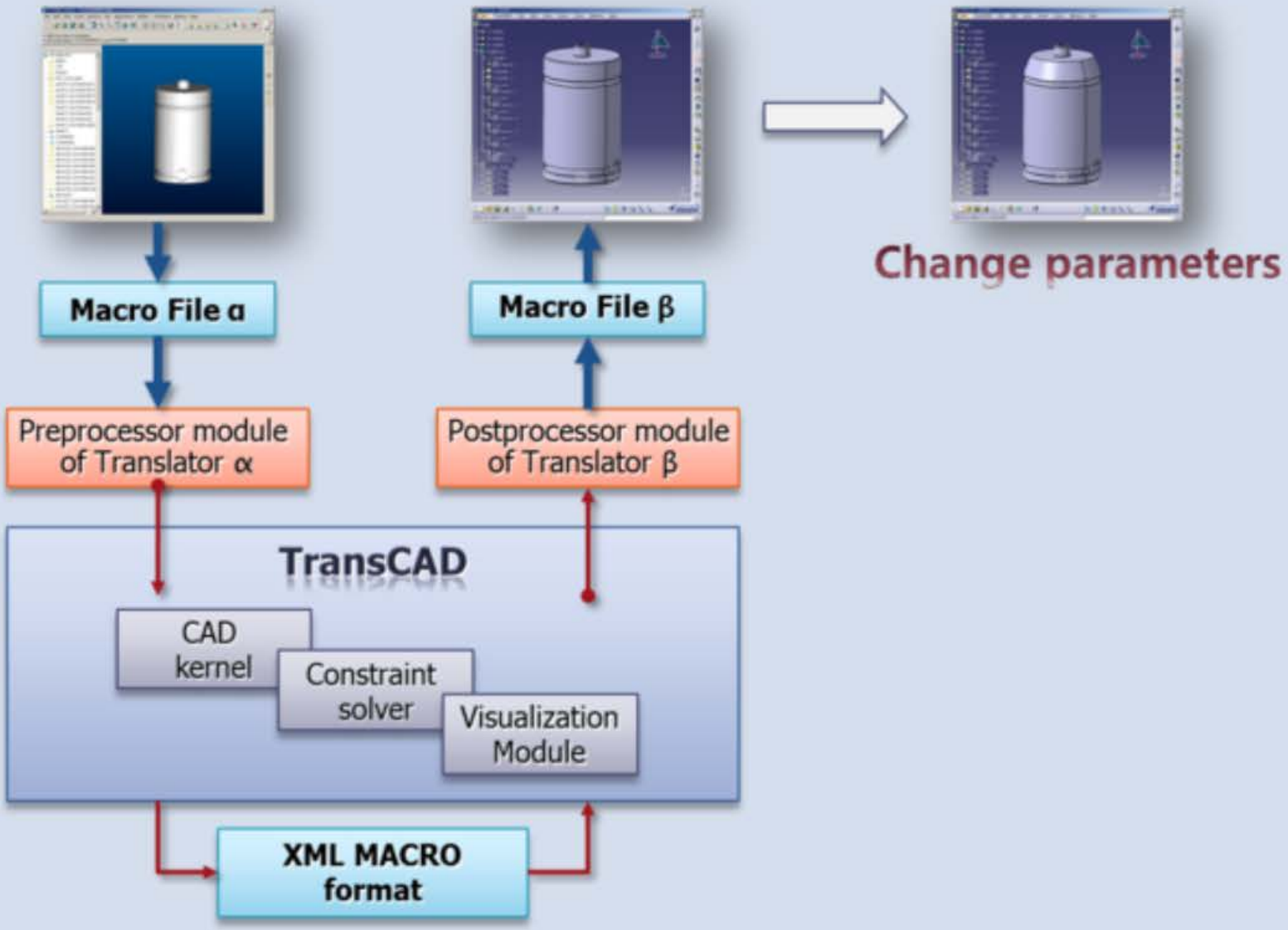
VR(Virtual Reality) allows human interaction with artificial objects. This artificial world is usually constructed by making artificial view, tactile s
The iCAD aboratory investigates problems which are based on Mechanical and Ocean Engineering using ICT technology.

Subpage

- CAD / STEP
  - Macro-parametrics Approach
- iCAD Videos
- VR (Virtual Reality)

번역

Translation of MACRO file




주의 요함 | www.kstep.or.kr
Korea STEP Center
KSTEP
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ISO
KS
STEP Meeting
JWG 21 Meeting
KSTEP보유책자
ISO 10303 STEP
INTRODUCTION
>STEP은 ISO에서 제정 중에 있는 새로운 국제표준으로, 제조업체에서 제품을 개발하고 생산할 때, 서로 다른 자동화 시스템 간에 제품정보를 교환하
는 공통의 언어 역할을 하는 인터페이스 기술이다. 형상모델(geometric model)과 제품모델(product model)의 차이점은, 형상모델이 순수한 수학적인 표
을 둔 것이라면, 제품모델은 형상모델을 포함하면서 추가로 가공과 생산을 위한 정보를 포함하는 확대된 개념이다.
STEP은 전자거래를 위한 핵심 기술표준의 하나이다. ISO(international standard organization)의 High level steering group on CALS (HLSGC, comme
speed)에서 추천한 세가지 전자거래 표준이 EDI(electronic data exchange), SGML(standard generalized markup language), STEP(standard for the e
product model data)으로, 이중에서 EDI는 금융, 매매 등의 상거래를 위한 표준 양식과 절차, SGML은 아래한글과 같은 워드프로세서를 위한 표준이며
술정보(technical data)를 포괄한다.
STEP Success Stories http://pdesinc.aticorp.org/success_stories/Success_Stories_19June2006_files/frame.htm
>STEP은 CAD/CAM 사용자를 위한 표준이다. 일반적으로 CAD를 공급하는 벤더들은 STEP과 같은 표준의 도입을 원하지 않는다. 특히 시장을 많이 점
는 리더급 벤더들은 표준화에 필요한 기술을 확보하고 있으면서도 적극적으로 지원하지 않는다. 그것은 사용자들이 특정 CAD시스템에서 자유로워지
운 일이 아니기 때문이다. 그러나 CAD 마켓에 새로 진입하는 소형 CAD 벤더들에게는 STEP과 같은 표준은 필요한 도구이다. 기존의 C
번역

JTC 1 Technology
Trend Report
2019

Digital Twin

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Digital twin

https://igotoffer.com/blog/digital-twin/

+ Smart Home

DTs = PT + DT

- Digital Twins = Physical Twin + Digital Twin
- Twins are two offspring produced by the same pregnancy
- Fidelity problem: Google Earth
- (realtime) Connection between twins

Automatic reconstruction of KAIST campus

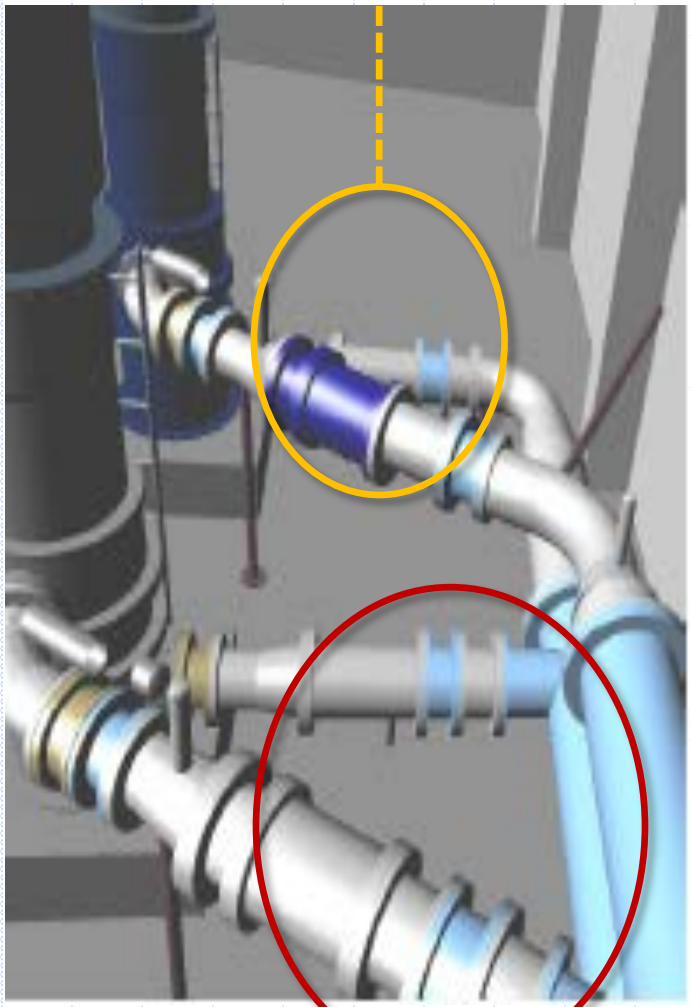
https://www.youtube.com/watch?v=ejuq1s2ygw4&feature=youtu.be

PhD of H Kim 2015

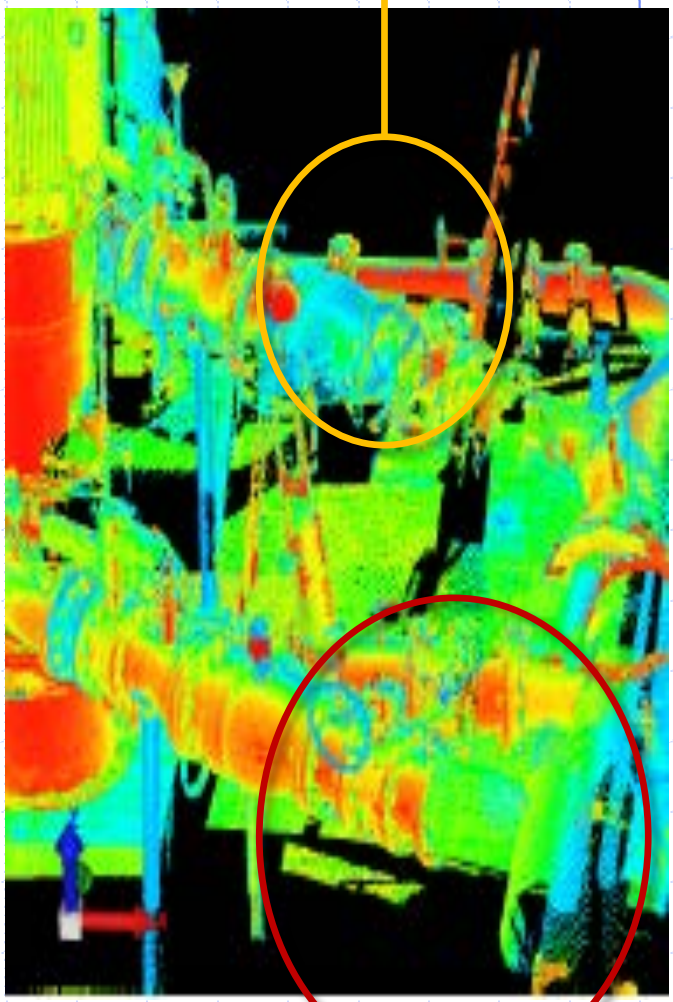
Difference between (As-built) vs. (As-designed)

Fidelity, LoD (level of detail)

Built



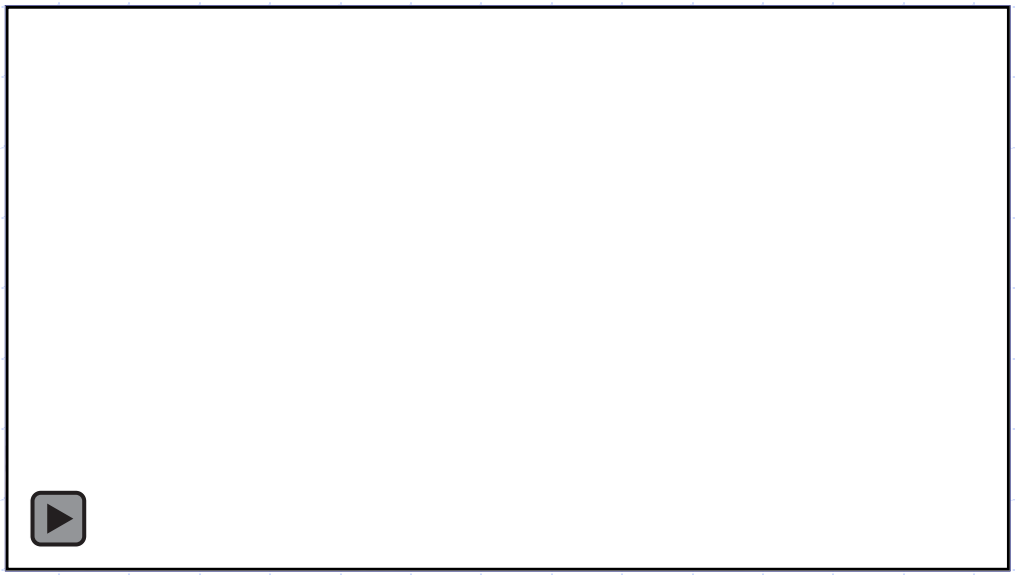
Design



Point cloud

Animation with points cloud

https://www.youtube.com/watch?v=2cFXDI_8RUA




thank you
danke
謝謝
рахмат
ngiyabonga
teşekkür ederim
спасибо
Баярлалаа
faafetai lava
vinaka
спасибі
blagodaram
dank je
misaotra
paldies
grazzi
matondo
mahalo
tapadh leat
gracias
хвала
asante
manana
obrigada
tenki
murakoze
chokrane
mamnun
дякую
djiere dieuf
tau
mochchakkeram
bedankt
nanni
nandri
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takk
dakujem
arigatô
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mèsi
didi madloba
kam sah hamnida
najis tuke
ありがとう
tanemirt
rahmet
grazie
terima kasih
rahmat
diolch
dhanyavadagalu
shukriya
merce
мерси
তোমাকে ধন্যবাদ
감사합니다
xièxie
ευχαριστώ
merci