SUTD-MIT INTERNATIONAL DESIGN CENTRE (IDC)

Undertake the impossible, Design the unexpected

SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Benchmarking of Design Centres

Date: 4 December 2013

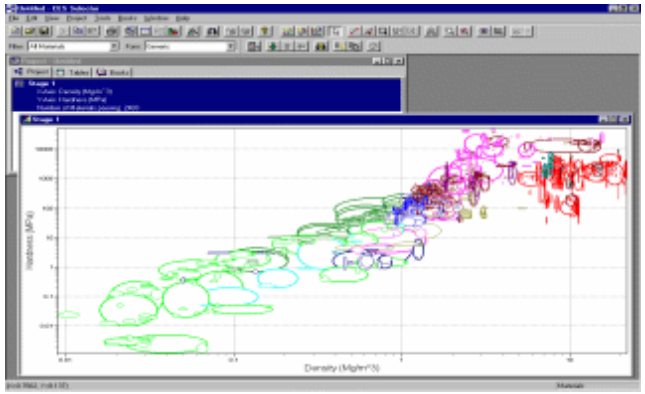

Centres

d. school

- The d.school is a hub for innovators at Stanford. Students and faculty in engineering, medicine, business, law, the humanities, sciences and education find their way here to the d.school.
- It welcomes the students with methodology for innovation that combines creativity across disciplines. This process is called Design Thinking
- A few organizations that partner with d.school: Visa, JetBlue, Gates Foundation, PepsiCo, Proctor&Gamble, Motorola & Google
- Director: George Kembel
- Website: http://dschool.stanford.edu

Engineering Design Centre (EDC)

- The Cambridge Engineering Design Centre undertakes research to create knowledge, understanding, methods and tools that will contribute to improving the design process. This is achieved through:
  - Innovative fundamental and applied research;
  - Knowledge transfer via education, training, publications and industrial collaboration; and
  - Promotion of the importance and benefits of engineering design in the UK.
- Several of its areas of specialty: knowledge management, process management, change management, computational design, healthcare design, inclusive design, design practice, and design management
- Director: Prof. P. John Clarkson
- Website: http://www-edc.eng.cam.ac.uk/



Segal Design Institute

- Segal Design Institute is affiliated with Northwestern University
- At Segal, it sees design as the deliberate shaping of the environment in ways that satisfy individual and societal needs. It is a process as much as an outcome, helping to identify core issues, addressing both current and future needs. Segal embrace the uncertainty of complex problems and expect understanding to evolve throughout the process.
- While the Institute's roots are in engineering design, Segal seeks and engage exerts in business, art, psychology and communication throughout the design process
- Directors: Prof. Greg Holderfield
- Website: http://www.segal.northwestern.edu/about/

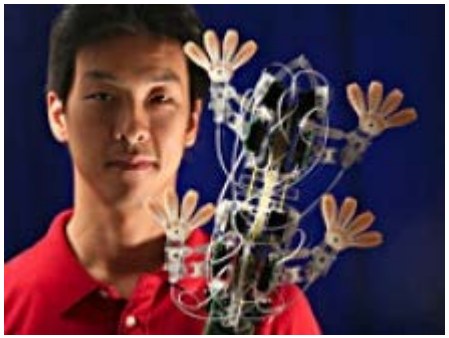
Berkeley Institute of Design

- The Berkeley Institute of Design (BiD) is affiliated with University of California, Berkeley
- BiD is a research group that fosters a deeply interdisciplinary approach to design for the 21st century, spanning human-computer interaction, mechanical design, education, architecture and art practice.
- BiD faculty & advisory board are presently designing the core courses, as follows:
  - Introduction to Design
  - Design to Realization
  - Visual Design
  - Narrative Design
  - Design Realization
  - Product Development
- Website: http://bid.berkeley.edu/

BiD
Berkeley institute of design

Centre for Design Research (CDR)

- CDR is affiliated with Stanford University
- The Centre for Design Research (CDR) is a community of scholars focused on understanding and augmenting engineering design innovation practice and education. They are dedicated to facilitating individual creativity, understanding the team design process, and developing advanced tools and methods that promote superior design and manufacturing of products. They develop concepts and technical solutions for design thinking, concurrent engineering, distributed collaborative design, and design knowledge re-use.
- Director: Prof. Larry Leifer
- Website: http://me.stanford.edu/research/centers/cdr/index.html



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The Innovative Design & Manufacturing Research Centre

- It is affiliated with University of Bath
- Areas of specialty:
  - **Advanced Machining Process & Systems:** the AMPS theme of the IdMRC covers processes and systems research with particular reference to responsive and customised manufacturing processes and systems integration - specifically interoperability and manufacturing information support systems.
  - **Constraint-Based Design & Optimization**: research in the CBDO theme is building on the Centre's long-standing expertise in machine, process and systems modelling
  - **Design Information & Knowledge:** the work within the DIAK research theme is focused on developing an understanding of the knowledge and information needs of engineers and of approaches to knowledge and information capture, organisation and management.
  - **Metrology & Assembly Systems & Technologies:** the MAST theme of the IdMRC covers metrology and assembly technologies and systems and deals with their integration, modelling and optimisation in advanced digital testing and verification environments
- Director: Dr. Ben Hicks
- Website: http://www.bath.ac.uk/idmrc/

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Department of Engineering Technology

- It is affiliated with University of Erlangen
- Areas of specialty:
  - Development of design assistance systems
  - Design for X, and decision-making
  - Process and workflow support in product development
  - SFB 396 Robust, shortened process for flat lightweight components
  - Tolerance synthesis and analysis
  - Development of tribological PVD-/PACVD-Schichten of Machine Elements and drive components
  - Investigation of Wälz-/Gleitkontaktes, especially friction bearings and bearing fatigue
- Director: Prof. Dr.-Ing. Sandro Wartzack
- Website: http://www.mfk.uni-erlangen.de/web/index.php?article_id=1&clang=0

Centre for Competitive Creative Design

- It is affiliated with Cranfield University
- Areas of specialty:
  - design policy
  - idea management
  - insight development
  - sustainable design.
- Director: Prof. Simon Bolton
- Website: http://www.centrefordesign.com

C4 D/ Centre for Competitive Creative Design

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Engineering Design and Innovation Centre

- EDIC is affiliated with National University of Singapore
- EDIC aims to:
  - **E**stablish and maintain the NUS Faculty of Engineering as an international leader in design innovation;
  - **D**evelop and broaden employment opportunities for engineering graduates,
  - **I**mplement and maintain programs to enrich engineering education, and
  - **C**onduct research aligned with industry and national needs.
- A key mission of the EDIC : to drive transformation in engineering education at the Faculty of Engineering, NUS. This is delivered through the Design Centric Programme (DCP) which emphasizes on Design Thinking
- DCP modules also include a foundational module on Design Thinking, where DCP students will learn how to identify and define problems and to formulate for innovative and creative solutions.
- Director: Prof. Lim Seh Cun
- Website: http://www.eng.nus.edu.sg/edic/index.html

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Labs

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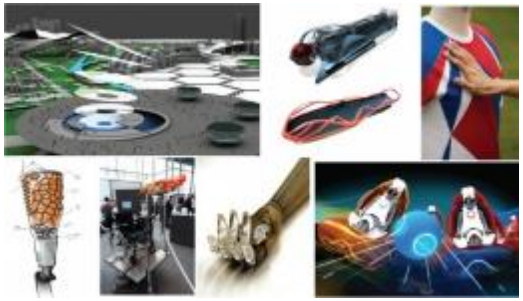
Design Engineering Group

- DEG is affiliated with Imperial College London
- Design Engineering at Imperial College London is concerned with research into:
  - the design process in industry,
  - the use of creativity tools in generative activity,
  - geometric modelling
  - the integration of analysis in the design process.



- Focus of Research:
  - Research by Theme: Creativity and Creativity Tools, Innovative Design Processes, Knowledge and Information Management, Security Design
  - Research by Collaboration: Digital Sensoria, Enabled, Helmet Performance and Design, Multiplicity, Siloet (Strategic Investment in Low Carbon Engine Technology)
- Directors: Prof. Peter Childs; Mr. Marco Aurischio; Dr. Mike Ristic
- Website: http://www3.imperial.ac.uk/designengineering

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Krasnov Institute for Advanced Studies

- It is affiliated with George Mason University
- Research areas consist of:
  - **Design Computing**
    - Computational models of creative design: evolutionary systems; analogy; emergence; situated agents, computational social science
    - Evolutionary systems in design: genetic engineering; style emergence, complex evolution
    - Ontologies: the development of the Function-Structure-Behaviour ontology and its application to designing, to designed objects and to designing processes
    - Situated design computing: computation founded on situated cognition concepts that allows the acquisition and re-use of experience
    - Visual representation and reasoning: emergence in design; shape representation; qualitative representations
  - **Design Cognition**
    - Cognitive studies of designing: protocol studies of designing; cognitive studies of design education, role of drawings in designing
    - Cognitive neuroscience of designing: the behavior of the brain while designing
- Research Professor: Prof. John S. Gero
- Website: http://mason.gmu.edu/~jgero/

The Integrated Design Innovation Group – The Lab

- The IDI Group is affiliated with Carnegie Mellon University
- The IDI Group focuses on the early design process. Our interests span from computational tools and theories to product development practice which work in concert to advance the state of the art in product creation
- The recent research consist of the following:
  - Design of Products with High-Emotional Value
  - Unification of Stylistic Form and Function
  - Finding Design Analogies
  - Design Team Convergence
  - Problem Solving Performance
  - Optimization for Renewable Energy
  - Neuro Mapping and Utility Theory for Decision Making
  - Multi-Scale Biology Based Design
- Director: Prof. Jonathan Cagan
- Website: http://www.andrew.cmu.edu/org/IDIG/index.html

Try to make a pattern that has five straight rows of coins with four coins in each row.

MADLab

- It is affiliated with University of Texas, Austin
- Areas of specialty:
  - Design Theory
  - Product Design
  - Reverse Engineering & Redesign
  - Geometric Modelling
  - Design Automation
  - Applications of Solid Free-Form Fabrication
  - Innovative Manufacturing Processes
  - A-Design
- Director: Dr. Richard H. Crawford
- Website: http://www.me.utexas.edu/~madlab/index.html

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OSU Oregon State Design ENGINEERING Lab

Design Engineering Lab

- Affiliated with Oregon State University, DEL's main area of research is design theory and methodology. It is basically the study of the science of design. Popular design methods provide a systematic approach to design problems. Most start by gathering customer needs and then proceed through steps which address engineering requirements, functional decomposition, concept generation, concept selection, product architecture, detail design and prototyping.
- The areas of specialty including: design research & methodology
- Current research projects are:
  - OSU's Design for an Environmental STEP Ahead: Solar Thermal Electric Panels, 2008
  - Residential Building Adaptive Energy Management System (R-BAEMS) Design, 2008
  - Collaborative Research: VOICED - A Virtual Organization for Innovative Conceptual Engineering Design
- Director: Prof. Robert B. Stone
- Website: http://designengineeringlab.org/

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Berkeley Expert System Technologies | BEST | Berkeley Energy and Sustainable Technologies

Department of Mechanical Engineering :: University of California, Berkeley

BEST Lab

- BEST Lab is affiliated with University of California, Berkeley
- The current research areas:
  - Design Metaphors, Design Theory, Design for Development, Digital Libraries, Ergonomics, Gender Equity, MEMS/Nano Synthesis, Mobile Learning, Next Digital, Pesticide Protection, Service Design, Smart Lighting, Smart Vehicles and Sustainable Design
- It has two major theme areas:
  - The Berkeley Expert Systems Technologies (BEST) Lab focuses on applied Artificial Intelligence, Expert Systems and Information Technologies.
  - The Berkeley Energy and Sustainable Technologies (BEST) Lab focuses on sustainable communities, sustainable product design, alternate energy and appropriate technologies
- Director: Prof. Alice Agogino
- Website: http://best.berkeley.edu/drupal/

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D- Lab

D-Lab
Development through Dialogue, Design & Dissemination

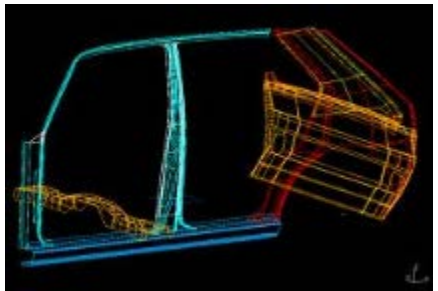
- D-Lab is a program at the Massachusetts Institute of Technology (MIT) that fosters the development of appropriate technologies and sustainable solutions within the framework of international development. D-Lab's mission is to improve the quality of life of low-income households through the creation and implementation of low cost technologies. D-Lab's portfolio of technologies also serves as an educational vehicle that allows students to gain an optimistic and practical understanding of their roles in alleviating poverty.
- There are currently sixteen different academic offerings that make up the suite of D-Lab classes, falling into the broad categories of Development, Design and Dissemination. Some of them are: Biodiversity, Cycle Ventures, Design, Development, Discovery, Dissemination WASH, Education, Energy, Health, ICT, Kuna Yala, Mobility, Schools, Supply Chains, and Waster
- Directors: Amy Smith & Victor Grau Serrat
- Website: http://d-lab.mit.edu

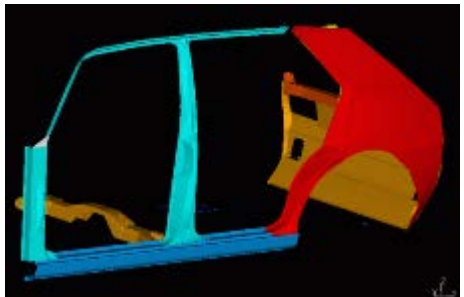




Caltech Engineering Design Research Laboratory

- Caltech Engineering Design Research Laboratory is affiliated with California Institute of Technology
- Research conducted in the Caltech Engineering Design Research Laboratory is concerned with developing a fundamental understanding of Engineering Design.
- The two major projects are related to:
  - the development of formal methods for representing and manipulating imprecision in design
  - structured methods for micro-electro-mechanical system (MEMS) design
- Director: Prof. Erik. K. Antonnson, Phd.D.,P.E
- Website: http://www.design.caltech.edu





Innovation, Design Study and Sustainability Laboratory (IDeaS Lab)

- It is affiliated with Indian Institute of Science
- Areas of specialty:
  - Requirement Engineering & Design for Variety
  - Design Synthesis & Creativity
  - Eco-Design & Sustainability
  - Design Collaboration & Knowledege Management
  - Product Aesthetics & Design for Emotions
  - Design Pedagogy
  - Design Reseach Methodology
- Director: Prof. Amaresh Chakrabarti
- Website: http://www.cpdm.iisc.ernet.in/ideaslab/

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CEDAR

Clemson Engineering Design Applications and Research

Clemson Engineering Design Applications and Research

- CEDAR is affiliated with Clemson University
- Its research interests include; collaborative design, CAD/CAM, Knowledge Management for Engineering, Distributed Decision Making, 3D Knowledge Archival and Retrieval, Automation of Design for Manufacturing, Design of Cellular Meso-structures, & Meta-material Design
- The goal of the CEDAR Group is to investigate research areas of design practice, method automation, and computational thinking in design in order to develop enablers or tools for designers that will aid in the product realization process.
- Directors:
  - Prof. Georges M. Fadel;
  - Assoc. Prof. Mary E. Kurz;
  - Assoc. Prof.Gregory M. Mocko;
  - Prof. Joshua D. Summers
- Website: http://www.clemson.edu/ces/cedar

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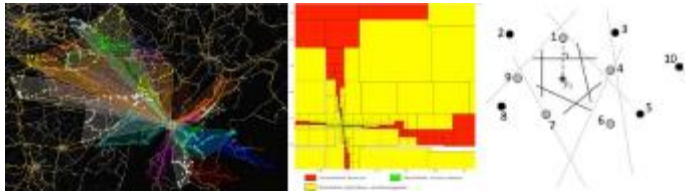
G-SCOP Lab

- It is affiliated with Grenoble Institute of Technology
- Areas of specialty:
  - Combinatorial Optimisation
  - Operations Research for Production Systems
  - Production System and Operation Management
  - Collaborative Design
  - Product-Process Design
  - Information Systems and Multiple Product Representations
- Director: Yannick Frein
- Website: http://www.g-scop.grenoble-inp.fr/

G-SCOP
SCIENCES POUR LA CONCEPTION, L'OPTIMISATION ET LA PRODUCTION



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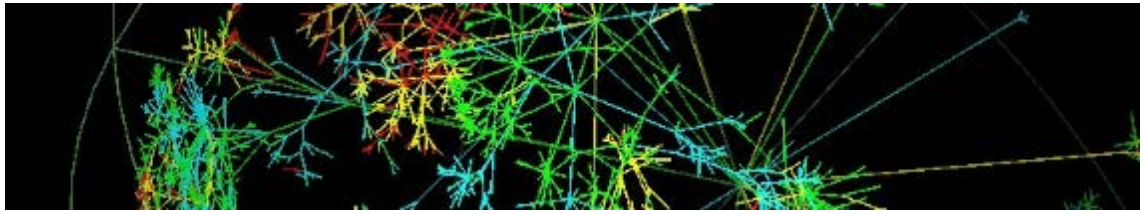
Complex Engineered System Design Laboratory (CESD Lab)

- It is affiliated with Oregon State University
- Area of specialty:
  - Risk and Failure informed design for software-hardware systems
  - System-level analysis of complex engineered systems
  - Design of Prognostics and Health Management (PHM) systems
  - Systems requirements development for software-hardware System design and reuse
  - Uncertainty analysis and modelling in large organizations
  - Function based design and modelling
- Director: Dr. Irem Y. Tumer, Ph.D
- Website: http://web.engr.oregonstate.edu/~itumer/index.html



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Programs

Machine Design

- It is affiliated with KTH Stockholm
- Area of specialty:
  - Internal Combustion Engines: the research is aimed at reducing CO2 emissions and local emissions, specifically particulate and NOx . Reducing CO2 is important for reducing energy consumption, greenhouse effect and global warming.
  - Integrated Product Development: research at the Department of Integrated Product Development focuses on organizational and technical processes for the efficient and effective development of innovative technology-oriented products, services and businesses.
  - Mechatronics: An important focus for this research area is to develop methods and tools for model based design of advanced mechatronic systems.
  - Embedded Control Systems: The ECS group is working in close cooperation with other international research teams and industry to improve current functionality in embedded control systems – and to introduce completely new functionality.
  - Systems & Component Design: EcoDesign, Machine Elements & Tribology, Product & Service Design
- Director: Prof. Margareta Norell Bergendahl
- Website: http://www.kth.se/en/itm/inst/mmk

Creative Design Institute (CDI)

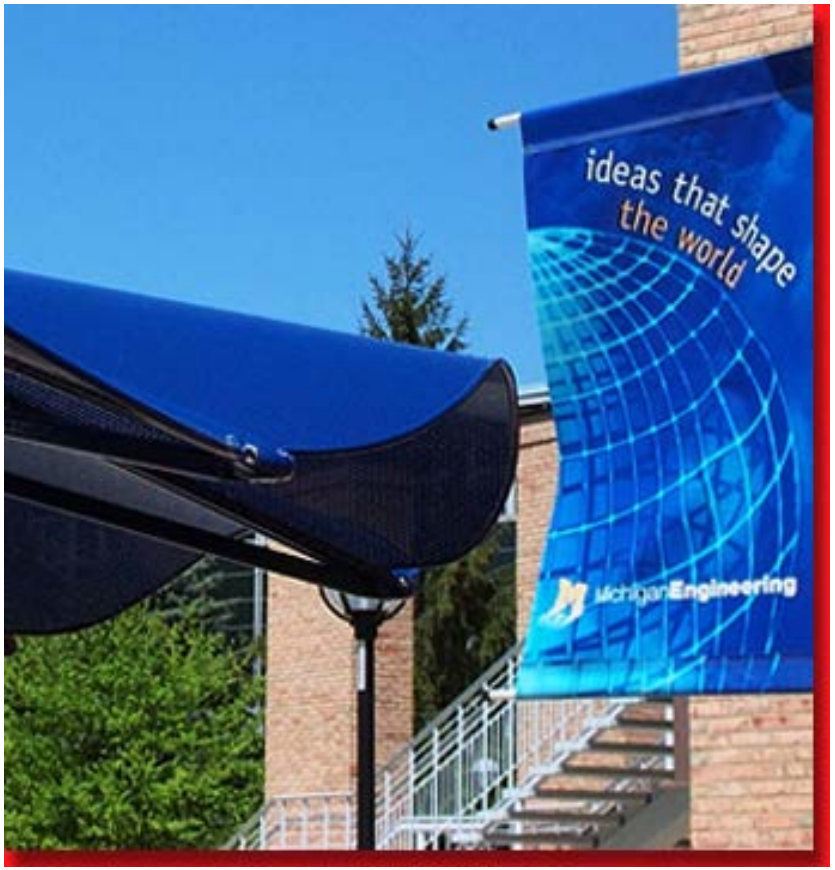
- It is affiliated with Sungkyunkwan University
- Areas of specialty:
  - **Design Foundation**: Design Process and Methodology, Design Creativity and Cognition, Design Education Paradigm for Future Designers
  - **Design Social Sciences**: Consumers, Users & Values; Social Cultural, Psychological & Educational Issues of Design; Design Management
  - **Design Informatics**: Computer-Aided Design Technology; Human-Cimputer Interaction; Semantic Technology & Design Computing; Artificial Intelligence & Design Computation
- Director: Prof. Yong Se Kim
- Website: http://cdi.skku.edu/cdi/01intro.html

Department of Management Engineering and Production (DIGEP)

- It is affiliated with Politecnico Di Tornio
- Areas of specialty:
  - Design and Methods of Industrial Engineering
  - Economics and Financial Analysis
  - Metrology and Quality
  - Industrial Equipment and Logistics
  - Organization and Management of Production Systems
  - Technology and Production Systems

- Director: Prof. Firoenzo Franceschini
- Website: http://www.digep.polito.it/it/la_ricerca

Design Science @University of Michigan



- The Program places an emphasis on quantitative and analytical approaches and seeks contributions to knowledge in the participating disciplines as well as in their integration.
- Example research areas include integration of marketing, economics and engineering, sustainable and life-cycle design, aesthetics, design of highly customized products, designing for an aging population, design and policy, design innovation and the psychology of design.
- Director: Prof. Richard Gonzales
- Website: http://designscience.umich.edu/

Loughborough Design School

- It is affiliated with Loughborough University
- Research in the Loughborough Design School is vibrant and world class, attracting external funding exceeding £3 million each year and is dedicated to advancing knowledge in a wide range of areas.
- Areas of specialty:
  - Design Education
  - Design Ergonomics
  - Design Practice
  - Environmental Ergonomics
  - Sustainable Design
  - Transport Safety,
  - User Centered Design

- Director: Prof. Tract Bhamra
- Website: http://www.lboro.ac.uk/departments/lds/

Department of Engineering & Design

- It is affiliated with Ilmenau University
- Areas of Specialty:
  - CurriEngineering design theory & methodology
  - Modelling of functional structures and technical principles
  - Variational and modularised design, feature-technology, constraint-solving, "knowledge-based engineering“
  - Use of audio-visual VR-technology in product development
  - Fundamentals of embodiment design in product development
  - Integration of embodiment design and calculation/simulation
  - Cost analysis and cost reduction in product development
  - Adjustment concepts for precision engineering products
- Director: Univ.-Prof.Dr.-Ing.Christian Weber
- Website: http://www.tu-ilmenau.de/en/engineering-design/

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Design Manufacturing and Engineering Management

- DMEM is affiliated with University of Strathclyde
- DMEM is an energetic and innovative department aiming to offer broad-based education and research of relevance to meet industrial and commercial needs. They are concerned with making organisations perform better through product, process and business development.
- Their research vision is for DMEM to be recognised as the world's leading international research centre for Total Engineering. DMEM is achieving this through excellence in:
  - product design and development,
  - manufacturing technology, and
  - engineering management.
- Director: Prof.Alex Duffy
- Website: http://www.strath.ac.uk/dmem/

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The Design Group

- The Design Group is affiliated with Open University
- Teaching and research in Design and Innovation have been part of the Open University (OU) since 1970. The OU has for over 30 years been a major player in researching and teaching the general principles, processes and practices of design. Their interdisciplinary non-domain-specific approach to both research and teaching is distinctive and aims at providing a rigorous understanding of the principles and processes of design for application across the creative industries. This ranges from product design to digital media, from engineering design to complex socio-technical systems.
- Research themes in the Design Group:
  - Design Processes and Products
  - Sustainable Design
  - Complexity Science and Design
- Director: Prof. Peter Llyod
- Website: http://design.open.ac.uk/index.htm

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Innovation Design Engineering

- IDE is affiliated with Royal College of Art
- The Innovation Design Engineering (IDE) programme is a leading-edge, creative product development course that involves experimentation, design, engineering and enterprise activities
- The programme requires that a wide range of design skills and thinking are utilised, such as industrial design techniques, manufacturing, mechanical engineering, design research, user-centred design and sustainability, among others
- Directors: Prof. Miles Pennington & Prof. Peter Childs
- Website: http://www.rca.ac.uk/Default.aspx?ContentID=160473&GroupID=159384&CategoryID=36692&More=1

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Sustainable Design & Manufacturing

- Affiliated with Georgia Institute of Technology
- Group focus is on cutting edge research that is strategic, pushes the boundaries, and creates real tangible impact
- The current projects are focused in three main technology domains
  - **Product Re-X:** Since 1992, our group has worked on issues related product recycling, recovery, remanufacture, reuse, etc. We call it re-X for short because there are many things you can do with a product at the end of its life
  - **Sustainable Mobility & Transportation:** Together with Ford Motor Company, we are working on re-defining mobility and transportation in urban regions (see Megacity Mobility project in Ford Motor Company Sustainability Report). It is not only limited to people transportation, but we also work on goods traffic.
  - **Factories of the Future**: The ultimate sustainable what we call “factory of the future” would be non-polluting, use renewable energy, and replenish any materials it consumed in a closed-loop fashion. Key elements to achieving this vision are benchmarks, assessment tools, and innovative manufacturing solutions and technologies
- Director: Tina Guldberg & Dr. Robert Bras
- Website: http://www.ecdm.gatech.edu/

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Industrial Design Engineering

- It is affiliated with TU Delft
- The research objective of Industrial Design Engineering is to foster sustainable well-being by exploring, generating and transferring knowledge and technologies for industrial design.
- Areas of specialty:
  - Strategic Design
  - User Experience,
  - Technology Transformation
  - Healthcare
  - Personal Mobility
  - Living/ Working

- Director: Prof. Ena Voûte
- Website: http://www.io.tudelft.nl/en/

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System Design and Management

- It is affiliated with Massachusetts Institute of Technology
- Areas of specialty:
  - **Energy and Sustainability**: Wind-generated Energy, Capturing the Energy in Ocean Waves, Carbon-Efficient Supply Chains, CO2 Geological Storage Options, Uncertainty in Impacts of Global Climate Change, Strategic Materials Decisions: Systems Insights to Improve Recyclability
  - **Extended Enterprises**: Carbon-Efficient Supply Chains, Change Propagation Analysis in Complex Technical Systems, Strategic Materials Decisions: Systems Insights to Improve Recyclability, Wal-Mart Transportation Portfolio Management
  - **Health Care Delivery**: Global Health Supply Chains, Non-Pharmaceutical Interventions for Flu Preparedness and Response, Driving Innovation in Aging and Human Technology Innovation, Driving Innovation in Aging and Human Technology Innovation
  - **Critical Infrastructures**: High-Speed Rail, Change Propagation Analysis in Complex Technical Systems, Real-Time Predictive Human Supervisory Control Models of Team Collaboration, New Approaches to Accident Modeling and System Safety, Real Options in System Design
- Director: Prof. Warren Seering
- Website: http://esd.mit.edu/about.html

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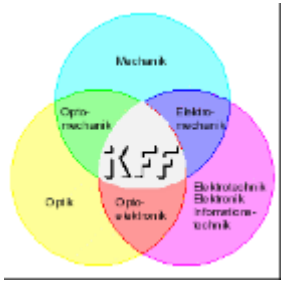
Engineering Design & Product Development

- It is affiliated with Technical University of Denmark.
- The research areas:
  - Engineering Knowledge Management
  - Product Development: product planning, product innovation, innovation of the product development organization, product development management
  - Engineering Design: product modeling, product architecture, conceptualization, detail design, computers in engineering design, design history, evaluation & decision making
  - Mechatronics: mechatronics systems & components, synthesis of mechatronic systems, methodology to create mechatronic products
  - Ecodesign
- Director: Prof. Henrik Carlsen
- Website: http://www.kp.mek.dtu.dk/English.aspx



Institute of Design and Production in Precision Engineering

- It is affiliated with University of Stuttgart
- The Principal Areas of Work:
  - **Electromechanical direct drive linear motors** : computer aided design of high energy permanent magnetic circuits for magnetically energized linear motor system.
  - **Aerostatic bearings:** investigation of the suitability of porous for aerostatic bearings
  - **Ultrasonic drives:** investigation and development of ultrasonic linear drives based on traveling waves.
  - **Injection molding:** production of precision parts and structures.
  - **System reliability**: transfer and verification of new and already known reliability methods on precision drives.
- The Director: Prof. Dr. –Ing. Wolfgang Schinköthe
- Website: http://www.uni-stuttgart.de/ikff/institut/info_eng.html



SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Institute of Product Development

- It is affiliated with Technical University of Munich
- Current Projects:
  - Architecting Manufacturing Industries and Systems for Adaptability
  - Biomimetics - Biological Solutions for Technical Products
  - Visio.M - Car concept for urban e-mobility
  - CAR@TUM Customer Experience - Systematic design and evaluation of customer experience
  - CAR@TUM Energy Management in power-driven vehicles III
  - FHMP - Functional Handling of Mechatronic Products
  - Knorr-Bremse – System strategy
  - SFB 768 - T1 - SFB 768 - A Methodology for Development of Cycle-driven Platform and Modular Strategies - Sub-project T1
- Director: Prof. Dr.-Ing. Udo Lindemann
- Website: http://www.pe.mw.tum.de/department

Product Development Group Zurich

- It is affiliated with ETH Zurich
- The current research projects:
  - Perception research via eye-tracking
  - Mechatronic machine elements
  - Test benches and procedures for validation of systems and man-machine interactions
  - Application of generative manufacturing processes within serial products
- Director: Prof. Mirko Meboldt
- Website: http://www.pdz.ethz.ch/index

Laboratoire Génie Industriel

- It is affiliated with École Centrale Paris
- Areas of specialty:
  - **Design Engineering**: the team has interest for design activities of firms which produce goods and services. However this research does not approach design as an activity in itself but rather in order to model, analyse (simulate and evaluate) and elaborate design systems
  - **Research Group on Decision Aid for Production / Distribution**: This research involve studying and optimizing production and distribution systems (bot for goods and services).
  - **Risk (Irindent round frame):** aim at creating or improving concepts, tools and methods in order to increase efficiency and effectiveness in project and multi-projects management, in the management of risk and robustness of projects, the design of project and multi-projects organisations, the structure of decision-making processes in projects
  - **EPOCC**
  - **Transversal projects**
- Director: Prof. Bernard Yannou
- Website: http://www.lgi.ecp.fr/pmwiki.php/Main/HomePage

SUTD-MIT INTERNATIONAL DESIGN CENTRE (IDC)

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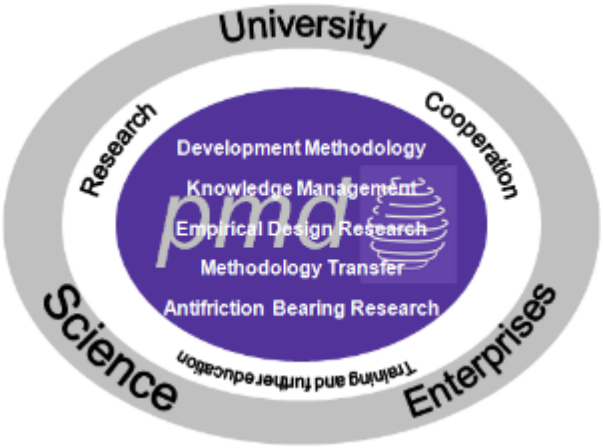
Department of Product Development and Machine Elements

- It is affiliated with Darmstadt University of Technology
- Areas of specialty:
  - Development methodology
  - Knowledge Management
  - Empirical design research
  - Methodology transfer
  - Antifriction bearing research
- Director:
  - Prof. Dr.-Ing. Dipl.-Wirtsch.-Ing. Peter Groche
  - Dr.-Ing. Hermann Kloberdanz
- Website: http://www.pmd.tu-darmstadt.de/pmd/fachgebiet_4/vision.en.jsp

pmd produktentwicklung maschinenelemente



SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Institute of Design

- It is affiliated with Illinois Institute of Technology
- Areas of Specialty:
  - Communication Design
  - Domain Applications
  - Product Design
  - Design Knowledge and Methods
  - Interaction Design
  - Product Design
  - System Design
  - Strategy and Decision-Making
- Director: Prof. Patrick Whitney
- Website: https://www.id.iit.edu/

Design and Product Development

- It is affiliated with University of Zagreb
- Areas of Specialty:
  - Strategy: business & product planning, portfolio analysis & market production platform, knowledge management, intellectual property
  - Organizations: development teams, collaboration, communication, conflict resolution & resource management
  - Processes: QFD, market research, prototypes, TRIZ, DFX, Taguchi, FMEA, standardization, modularization, PLM, the creative problem solving & materials
  - Technology: IT product models, PDM, PLM, CAD/ CAM, CAE-FEA, RP, KBE, visualization, product configurator, digital mock-up, production technologies
- Director: Prof. Dorian Marjanovic
- Website: http://www.crp.fsb.hr/index.php?menu=71&action=62

Institute of Product Engineering

- It is affiliated with Karlsruhe Institute of Technology
- Areas of specialty:
  - Drive System Engineering
  - Mechatronic Systems
  - Microsystem technology
  - Friction systems/ Tribological systems
  - Product Development
- Director: o. Prof. Dr.-Ing. Dr. h. c. Albert Albers
- Website: http://www.ipek.kit.edu/english/Institut.php

IPEK
Institut für Produktentwicklung
am KIT ▪ o. Prof. Dr.-Ing. Dr. h.c. A. Albers

School of Mechanical Engineering

- It is affiliated with Tel Aviv University
- Areas of specialty:
  - Interleaving design theory, practice, and education
  - Product design, development, innovation and creativity
  - Systems Engineering
  - Knowledge Management
  - Artificial intelligence techniques for solving engineering problems
  - Machine learning/ case-based reasoning/ data mining/ knowledge discovery
  - Design research methodology
- Director: Prof. Yoram Reich
- Website: http://www.eng.tau.ac.il/~yoram/

Organization of Advance Science & Technology

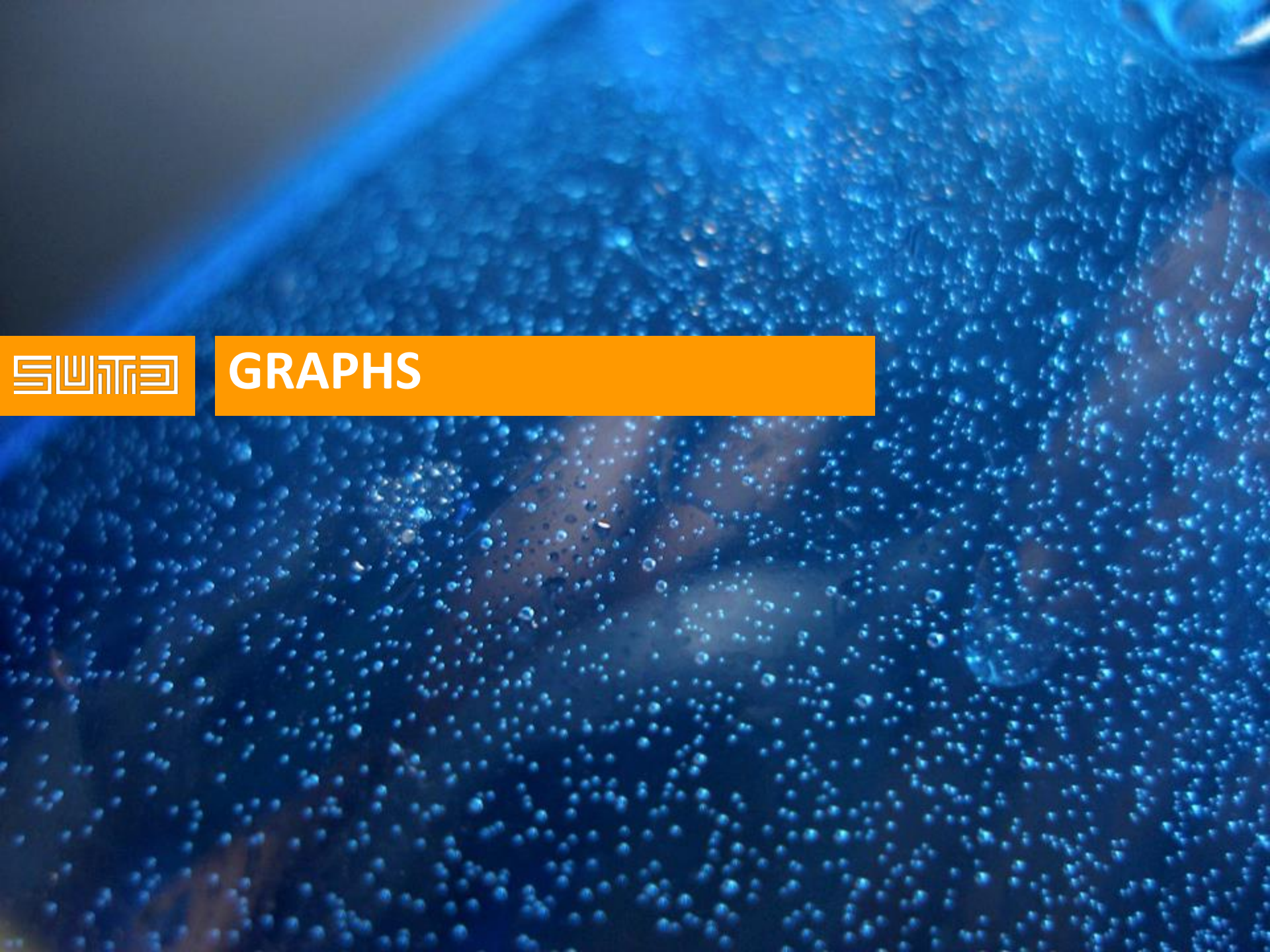
- It is affiliated with Kobe University
- Areas of specialty:
  - several research issues that focus on the creative thought process of both engineering and industrial design, including interdisciplinary aspects of design science.
  - The research aim is to identify standard characteristics of design, i.e. answering the question “what is design?” from the viewpoint of creativity.
- Director: Prof. Toshiharu Taura
- Website:
  - http://www.research.kobe-u.ac.jp/eng-mech-design/taura/CV-e20130401.html
  - http://www.oast.kobe-u.ac.jp/en/index.html

School of Engineering & Mathematical Science (Mechanical Engineering)

- It is affiliated with City University (London)
- Areas of specialty:
  - Positive Displacement Machines
  - Application of CFD and CCM to Screw Machines
  - Methodology of Engineering design
  - Engineering Design Competences
- Howden Chair in Engineering Design and Compressor Technology: Prof. Ahmed Kovacevic
- Website: http://www.city.ac.uk/engineering-maths/staff/professor-ahmed-kovacevic

Wayne & William White Engineering Design Center

- The EDC is affiliated with the University of British Columbia
- The EDC areas of specialty:
  - Mechanical
  - Materials
  - Sensor
  - signal processing
  - wireless communication
  - Software
  - Engineering
  - commerce,
- Director: Prof. Philippe Kruchten, EECE
- Website: http://design.engineering.ubc.ca/


GRAPHS

SUTD-MIT INTERNATIONAL DESIGN CENTRE (IDC)

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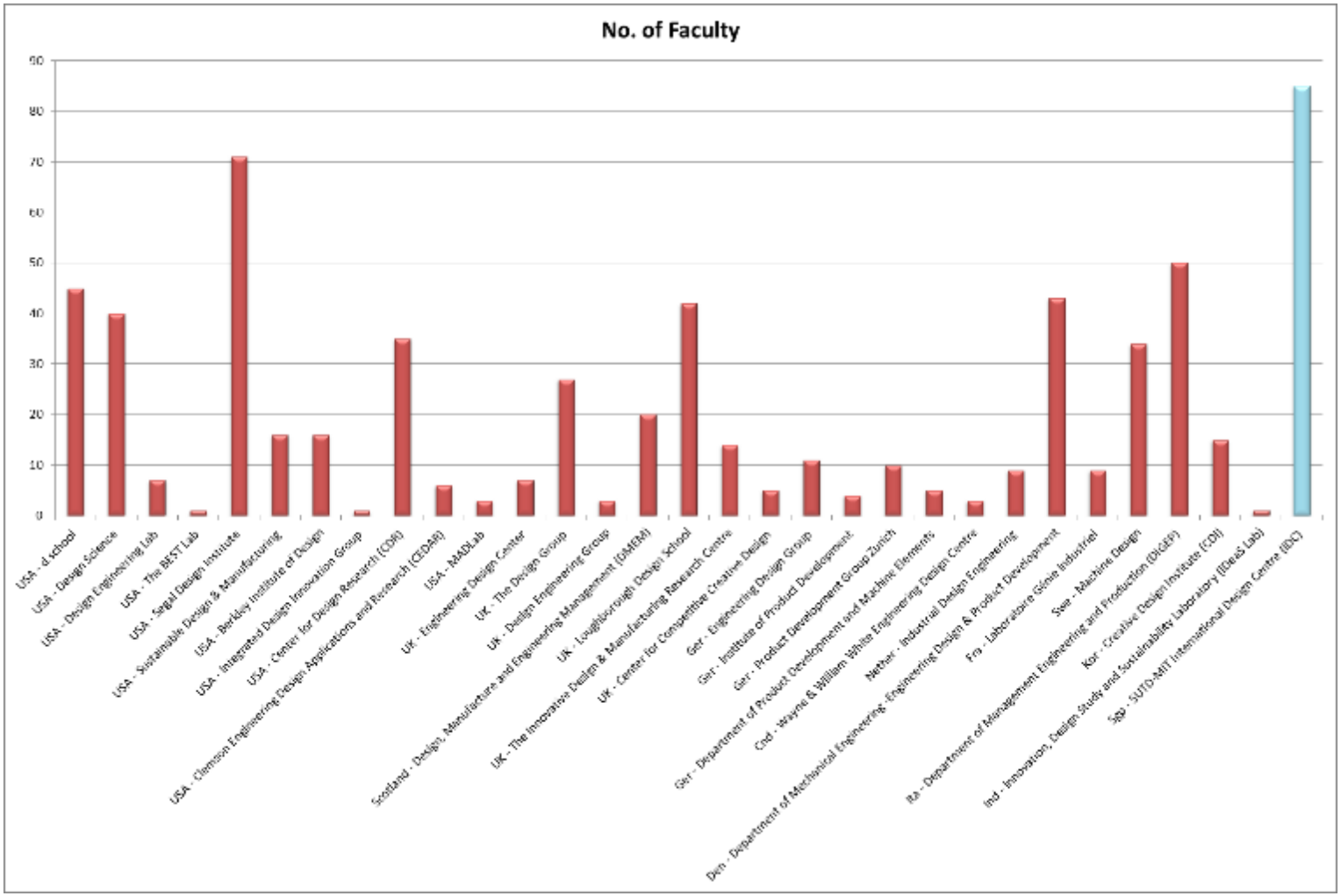
SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN



Remarks:

Data is being collected through an ongoing process of direct correspondences with the Design Centres as well as from their respective websites.

Date: 4 Dec 2013

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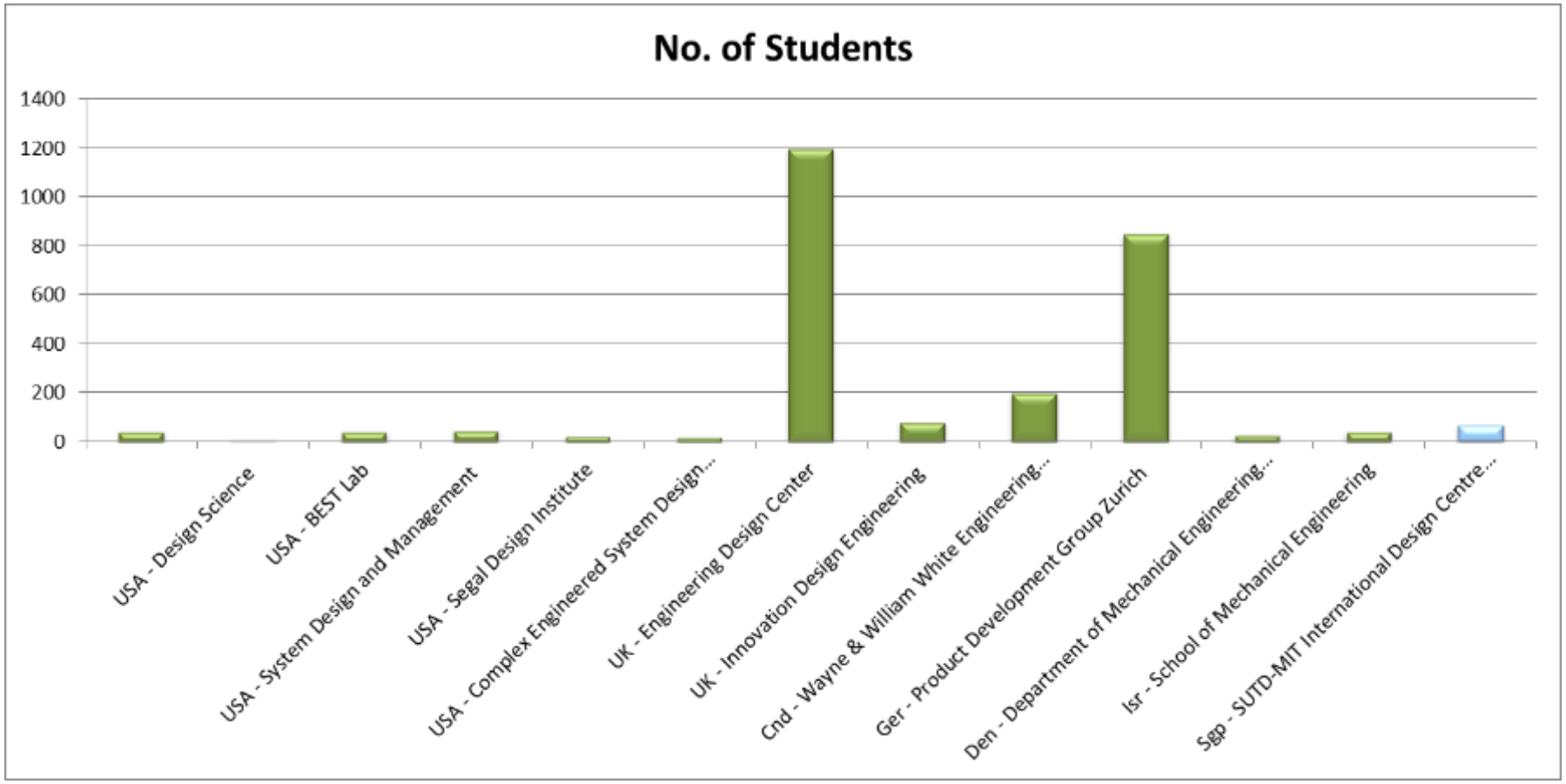
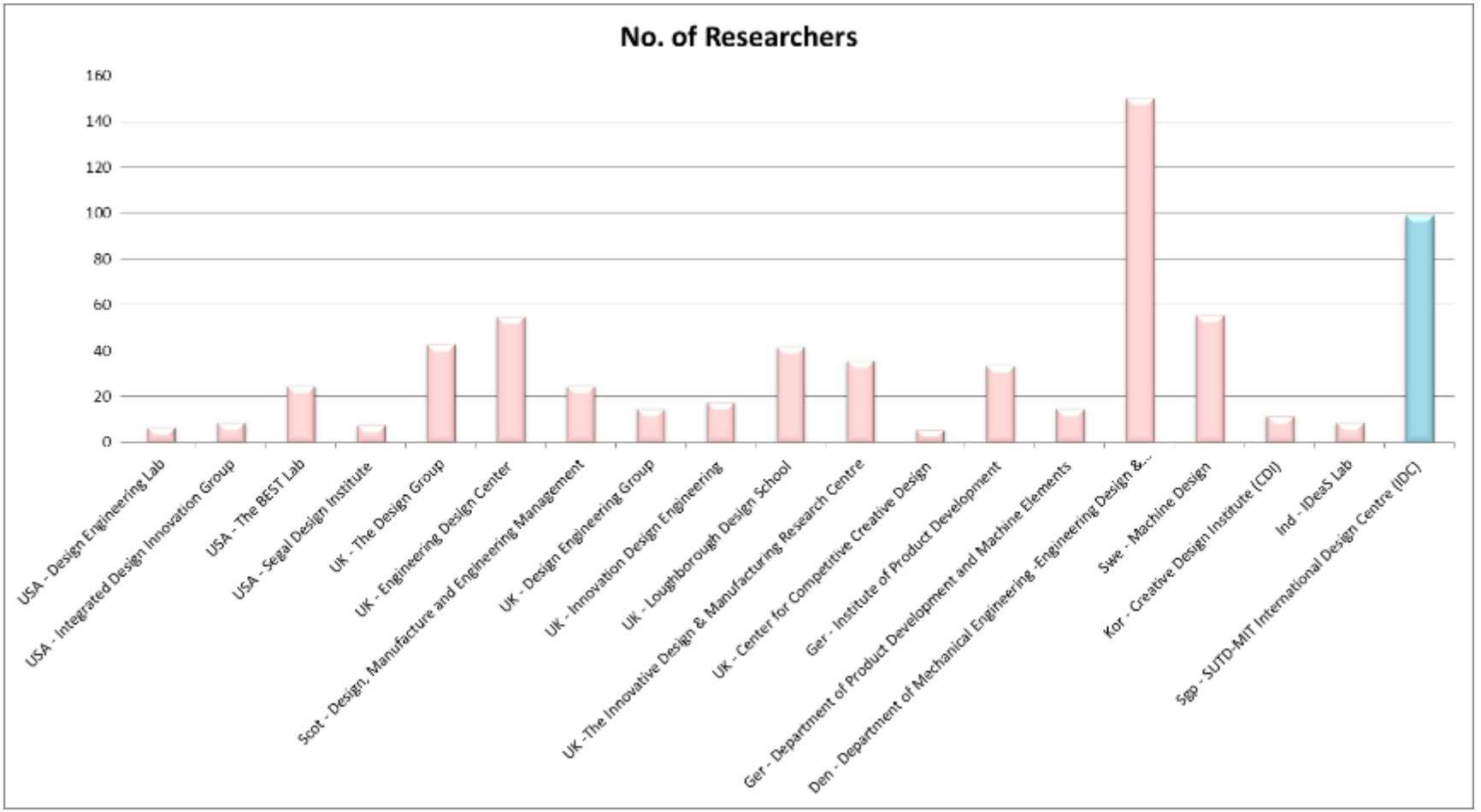


Remarks:

- Data is being collected through an ongoing process of direct correspondences with the Design Centres as well as from their respective websites.
- Number of students represents a combination of Undergraduate students.

Date: 4 Dec 2013



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SUTD-MIT INTERNATIONAL DESIGN CENTRE (IDC)

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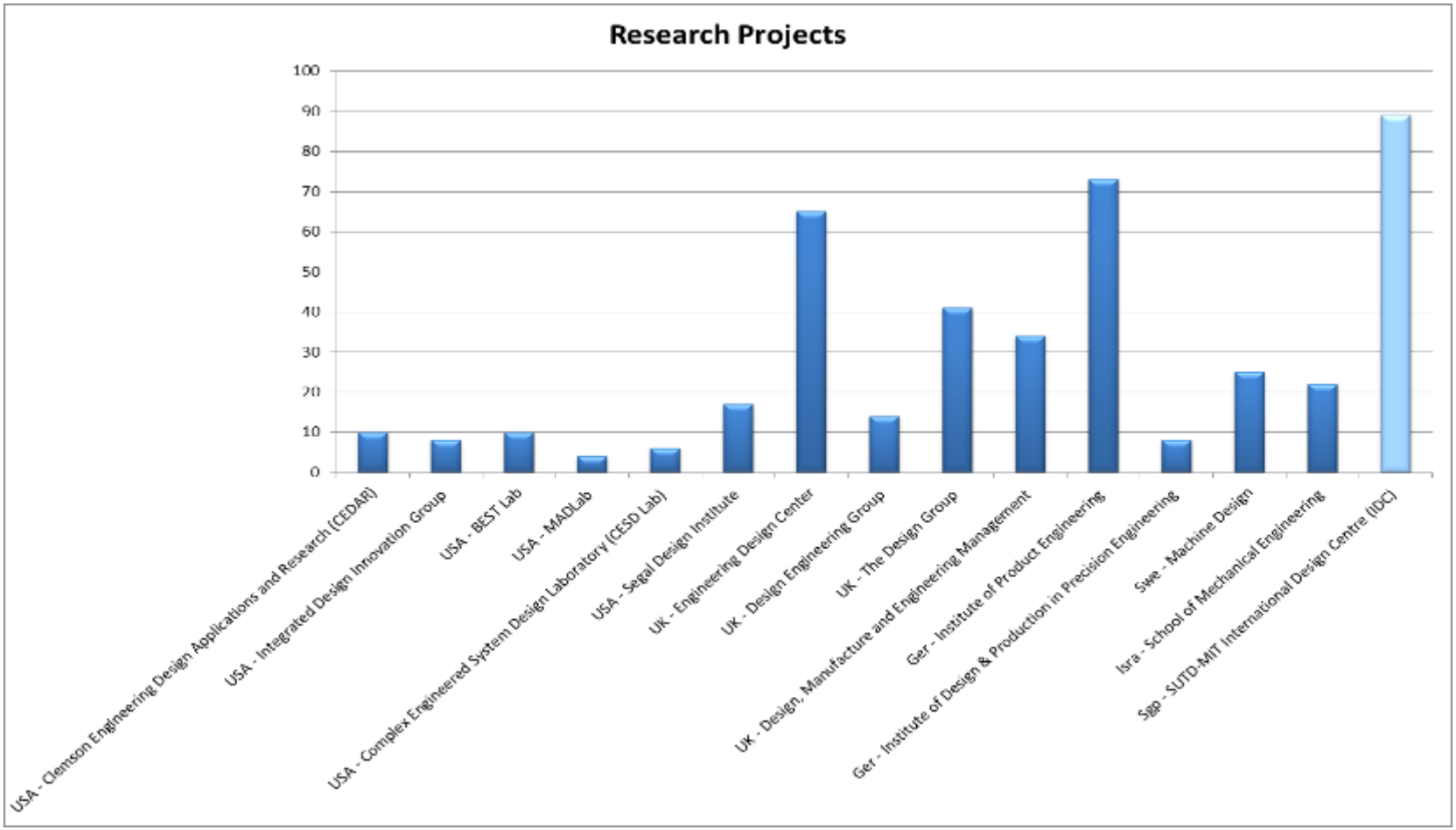
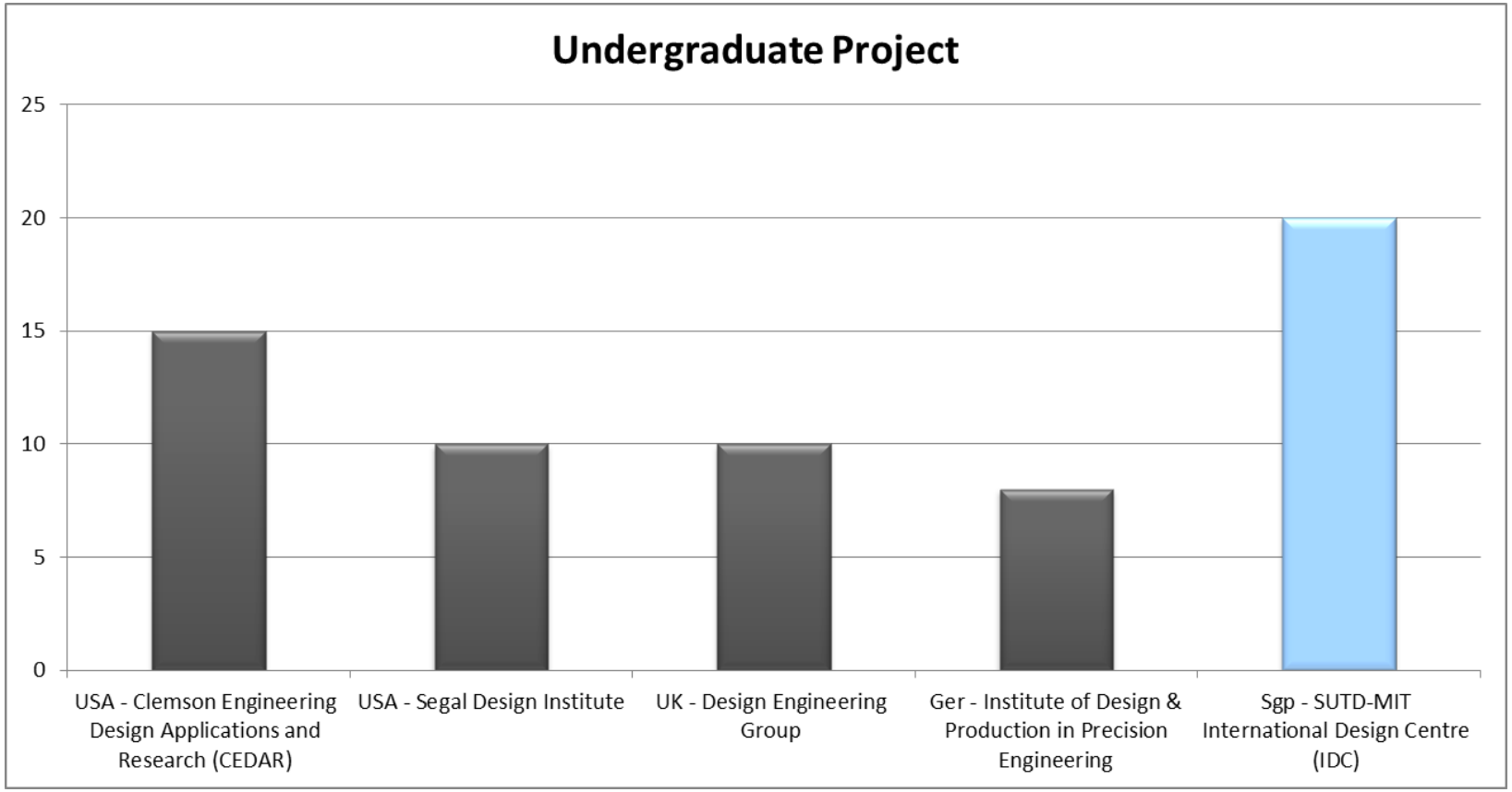


Remarks:

- Data is being collected through an ongoing process of direct correspondences with the Design Centres as well as from their respective websites.
- Research projects represent projects that being done by Master & Postdocs researchers, together with the Faculties

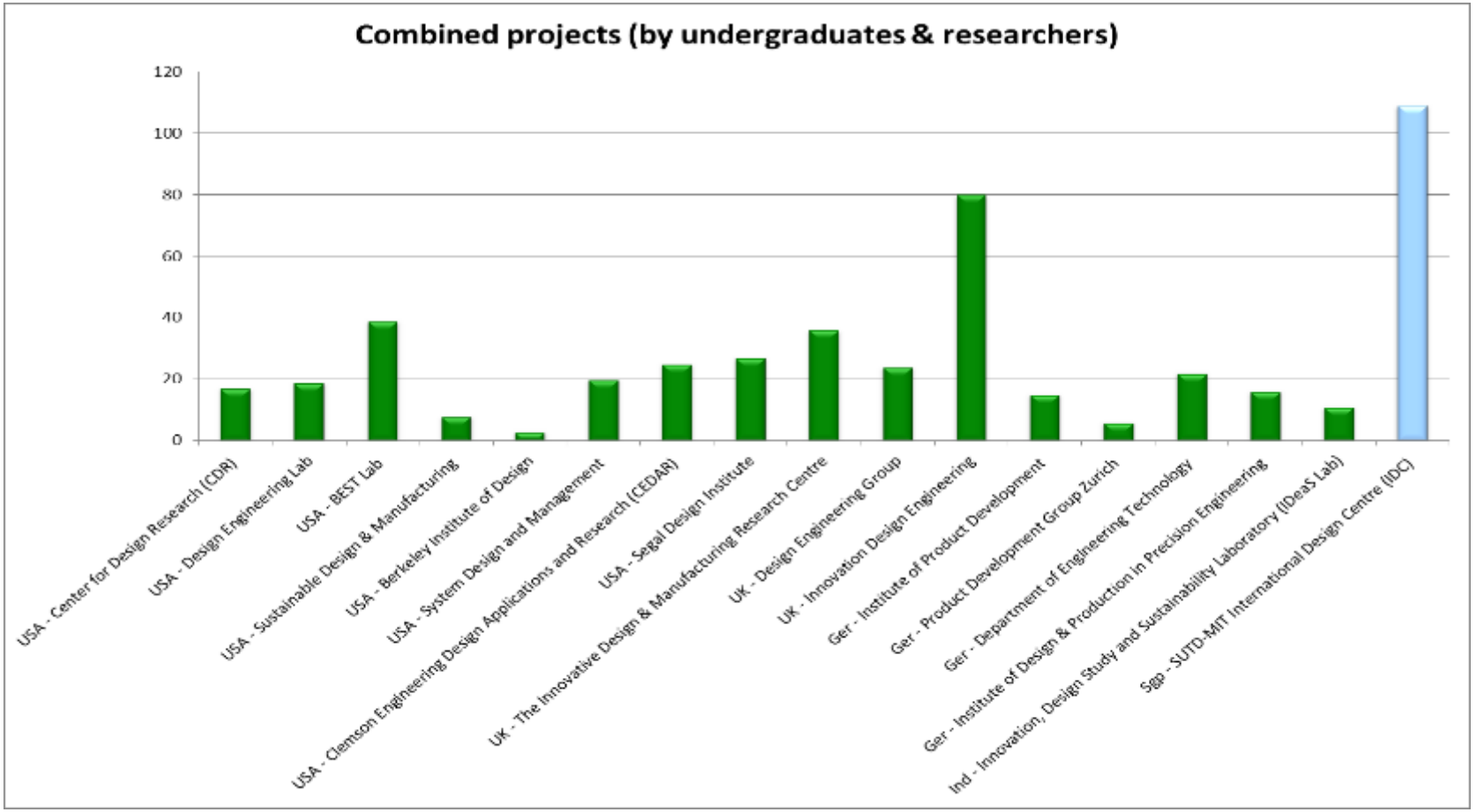
Date: 4 Dec 2013



Remarks:

- Data is being collected through an ongoing process of direct correspondences with the Design Centres as well as from their respective websites.
- Some of the Design Centres do not have any Undergraduate projects, hence, they are not listed in this list.

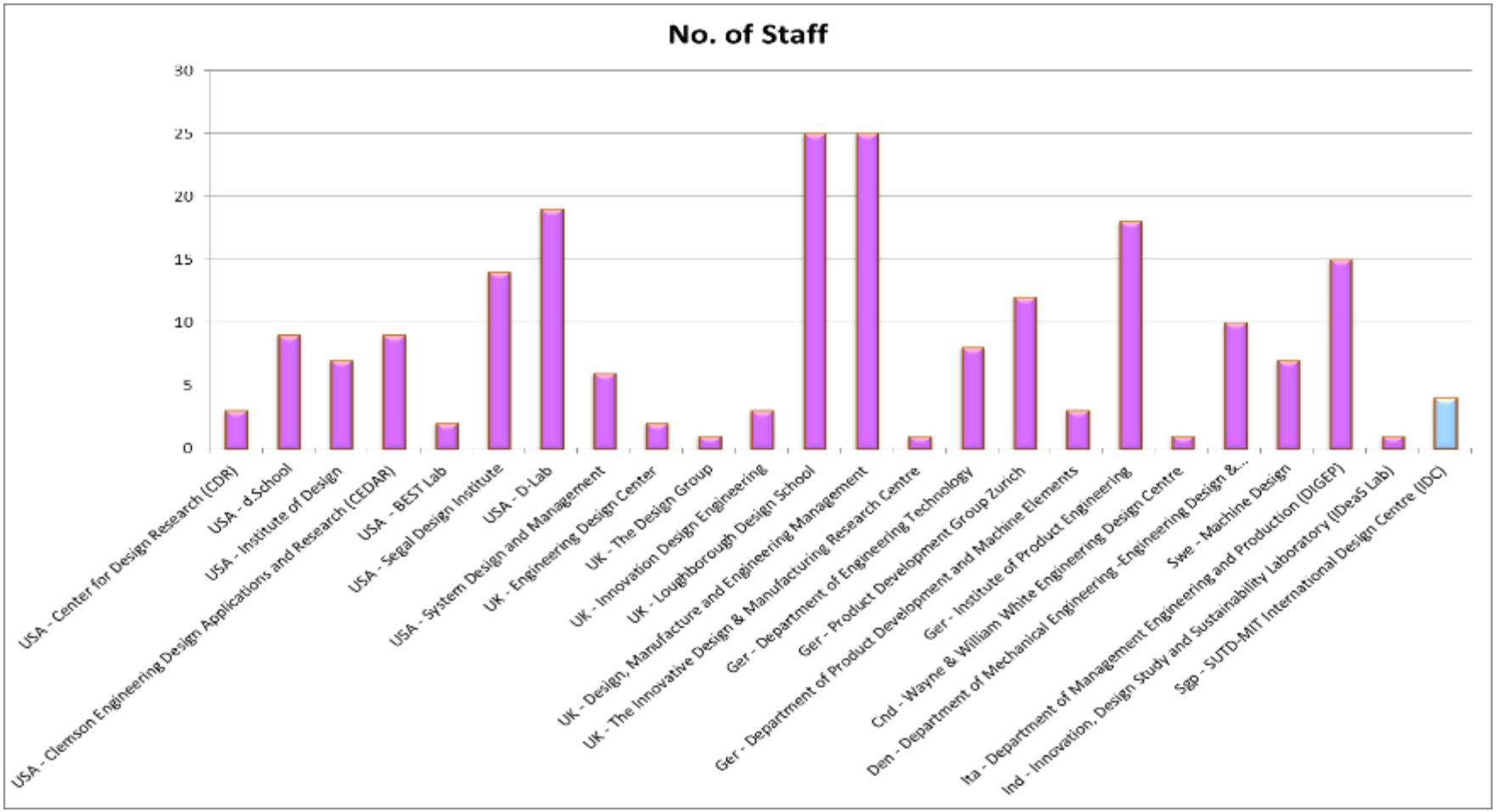
Date: 4 Dec 2013



Remarks:

- Data is being collected through an ongoing process of direct correspondences with the Design Centres as well as from their respective websites.
- Combined projects refer to project that jointly done by Undergraduate and Postdocs researchers.

Date: 4 Dec 2013



Remarks:

- Data is being collected through an ongoing process of direct correspondences with the Design Centres as well as from their respective websites.
- The number of staff represents staff in Administration, IT, Workshop & Technical Services.

Date: 4 Dec 2013

SUTD-MIT INTERNATIONAL DESIGN CENTRE (IDC)

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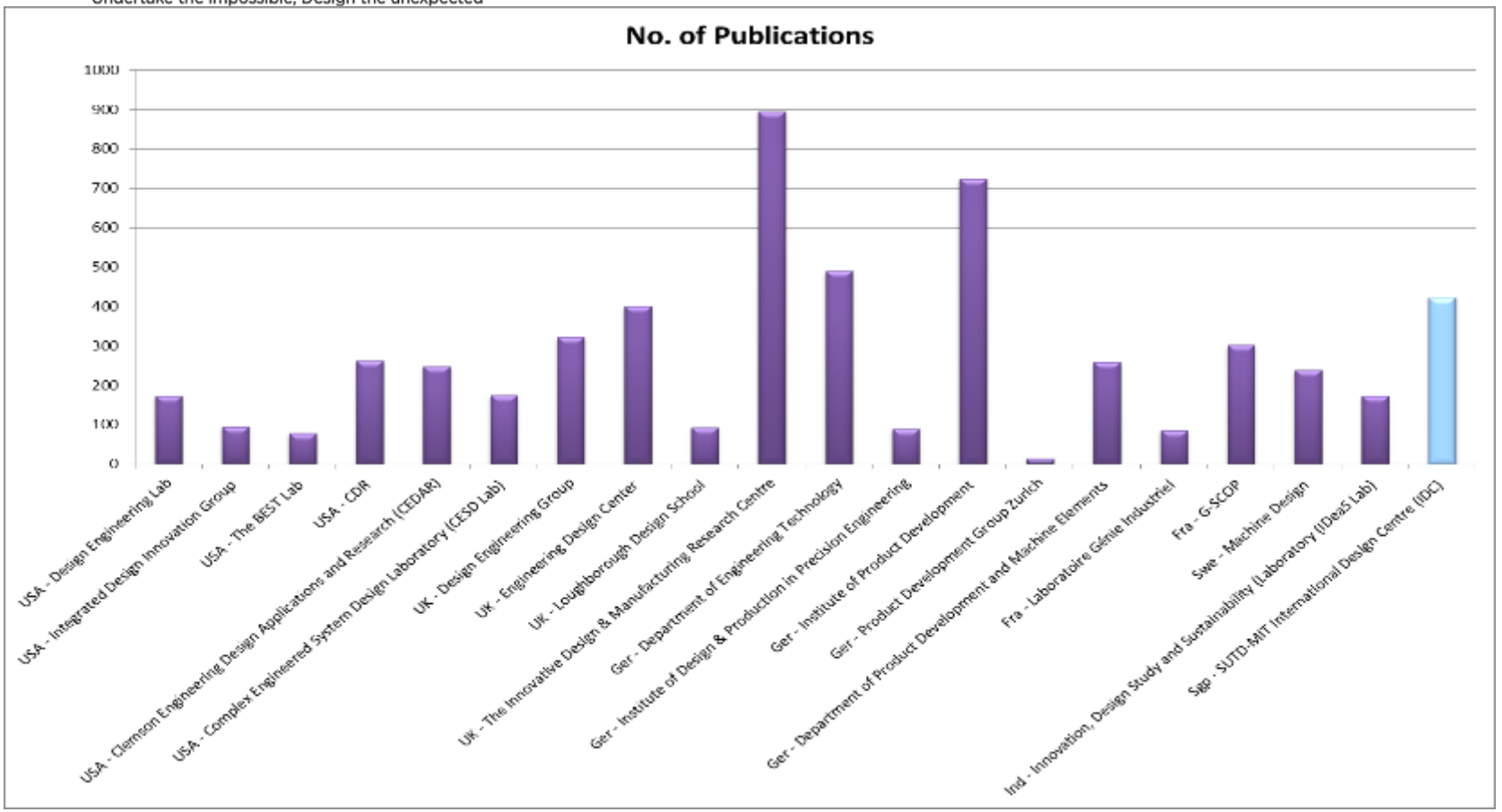
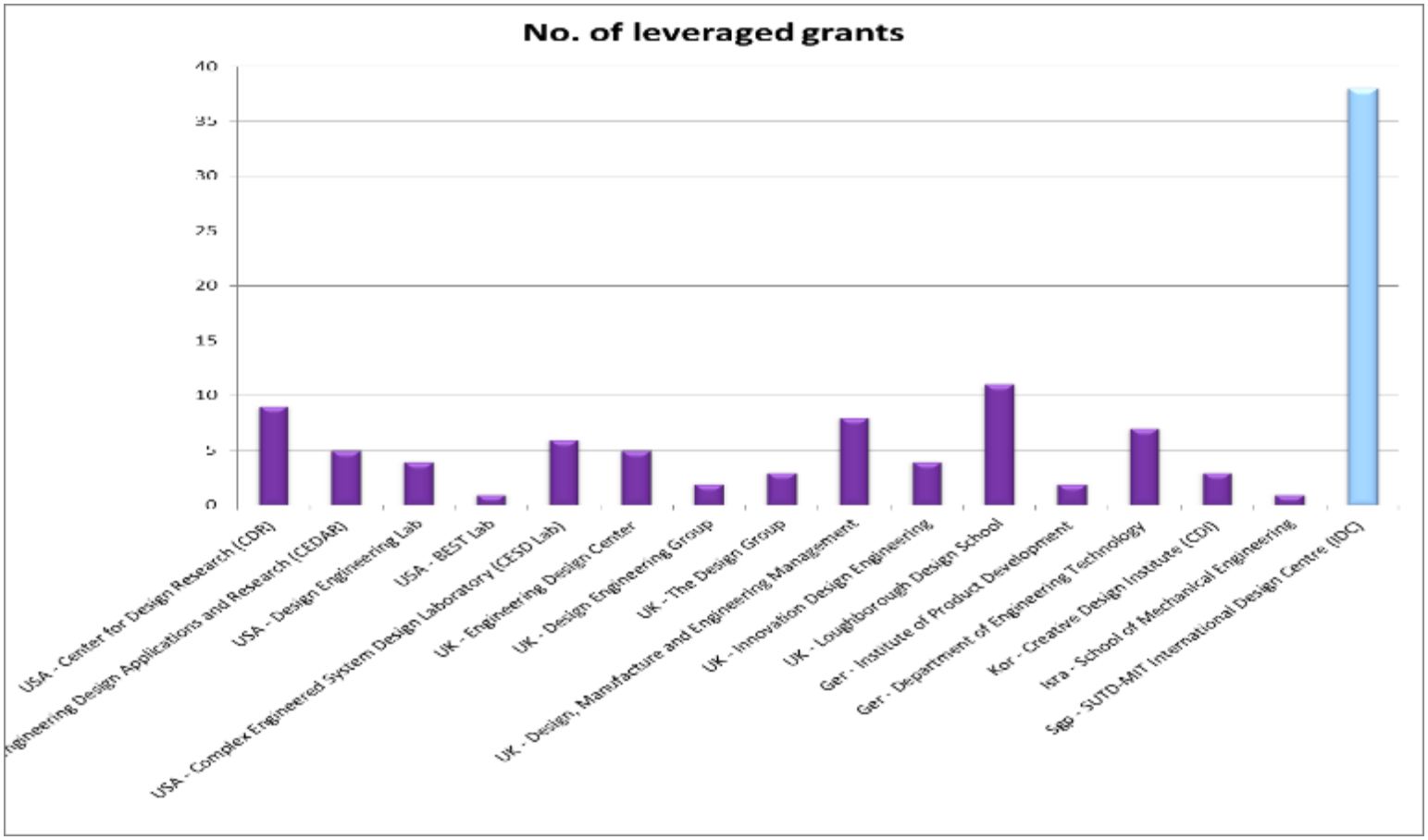


Remarks:

- Data is being collected through an ongoing process of direct correspondences with the Design Centres as well as from their respective websites.
- Number of publications is not the focus for some of the Design Centres and hence not listed.

Date: 4 Dec 2013



Remarks:

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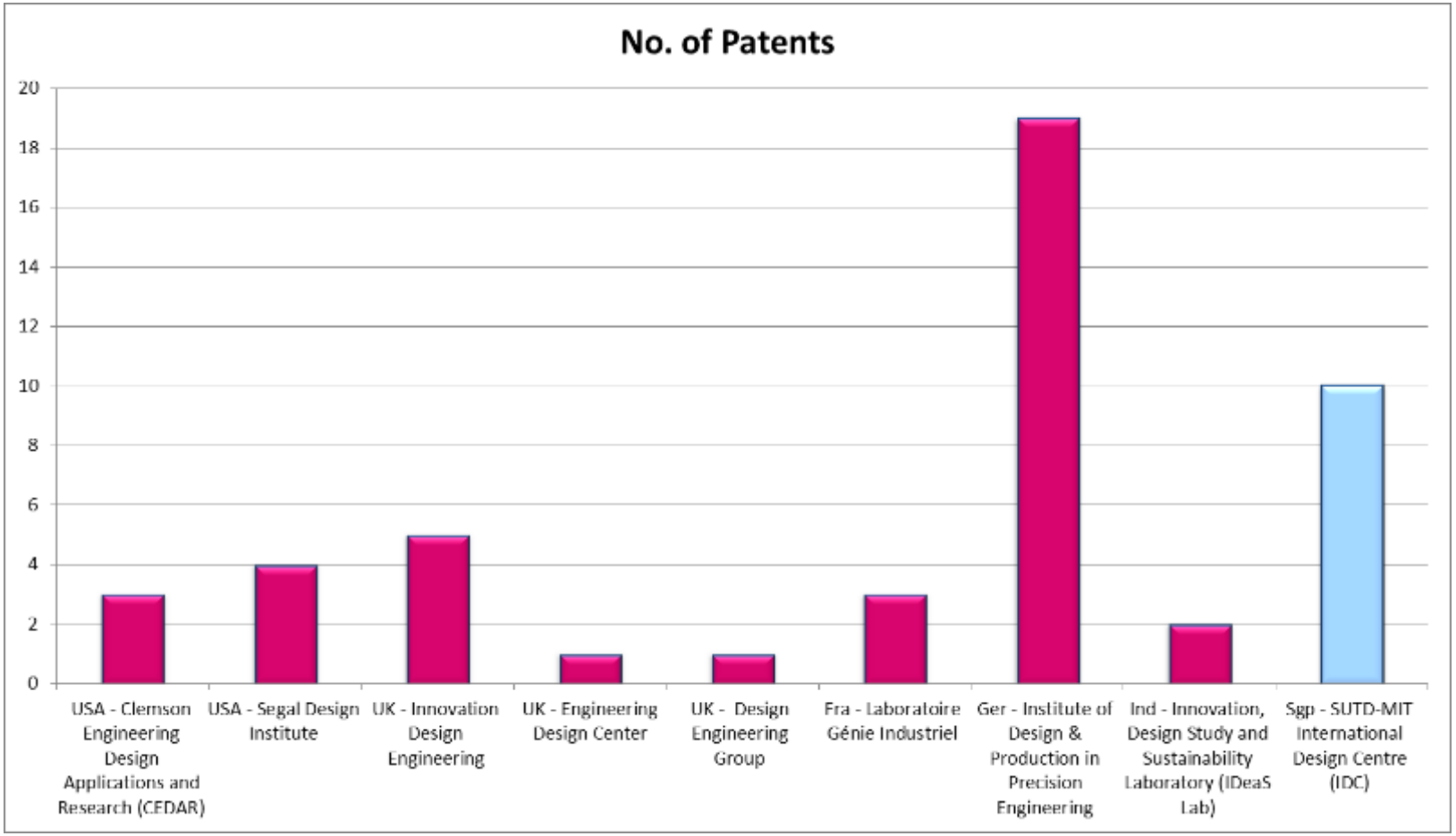
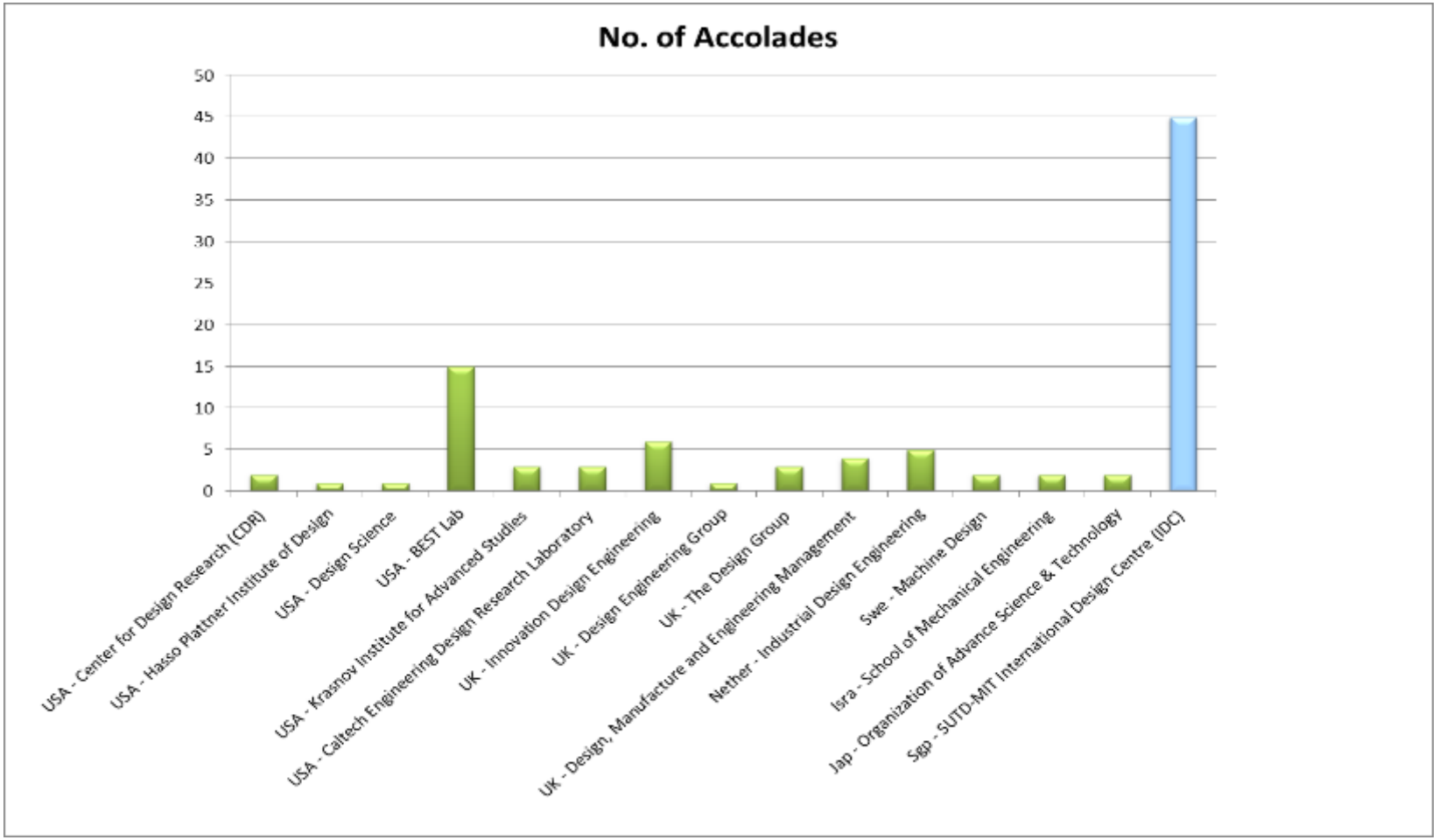


Remarks:

- Data is being collected through an ongoing process of direct correspondences with the Design Centres as well as from their respective websites
- Number of patents is not the focus for some of the Design Centres, hence it is not listed in this graph.



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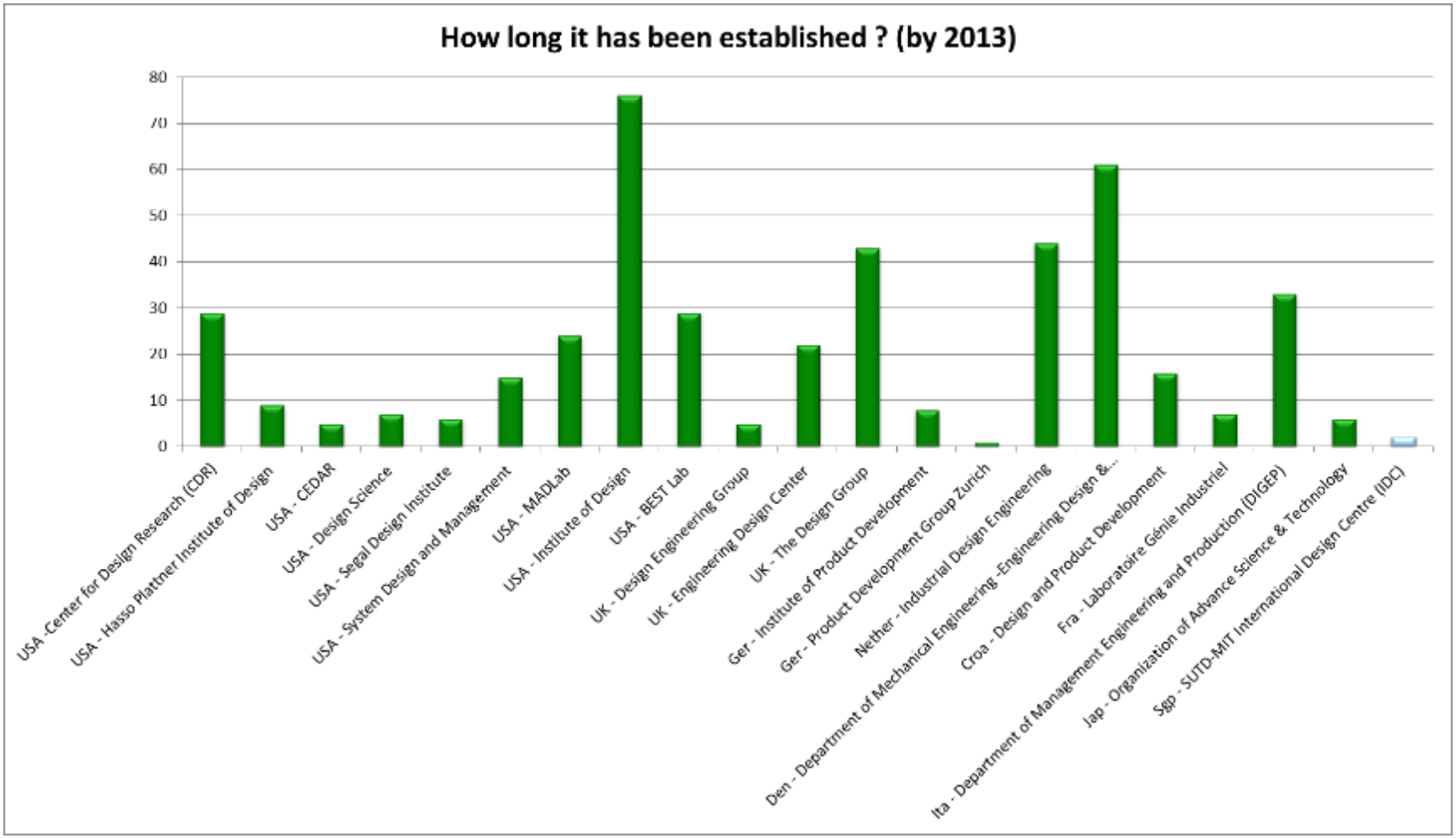

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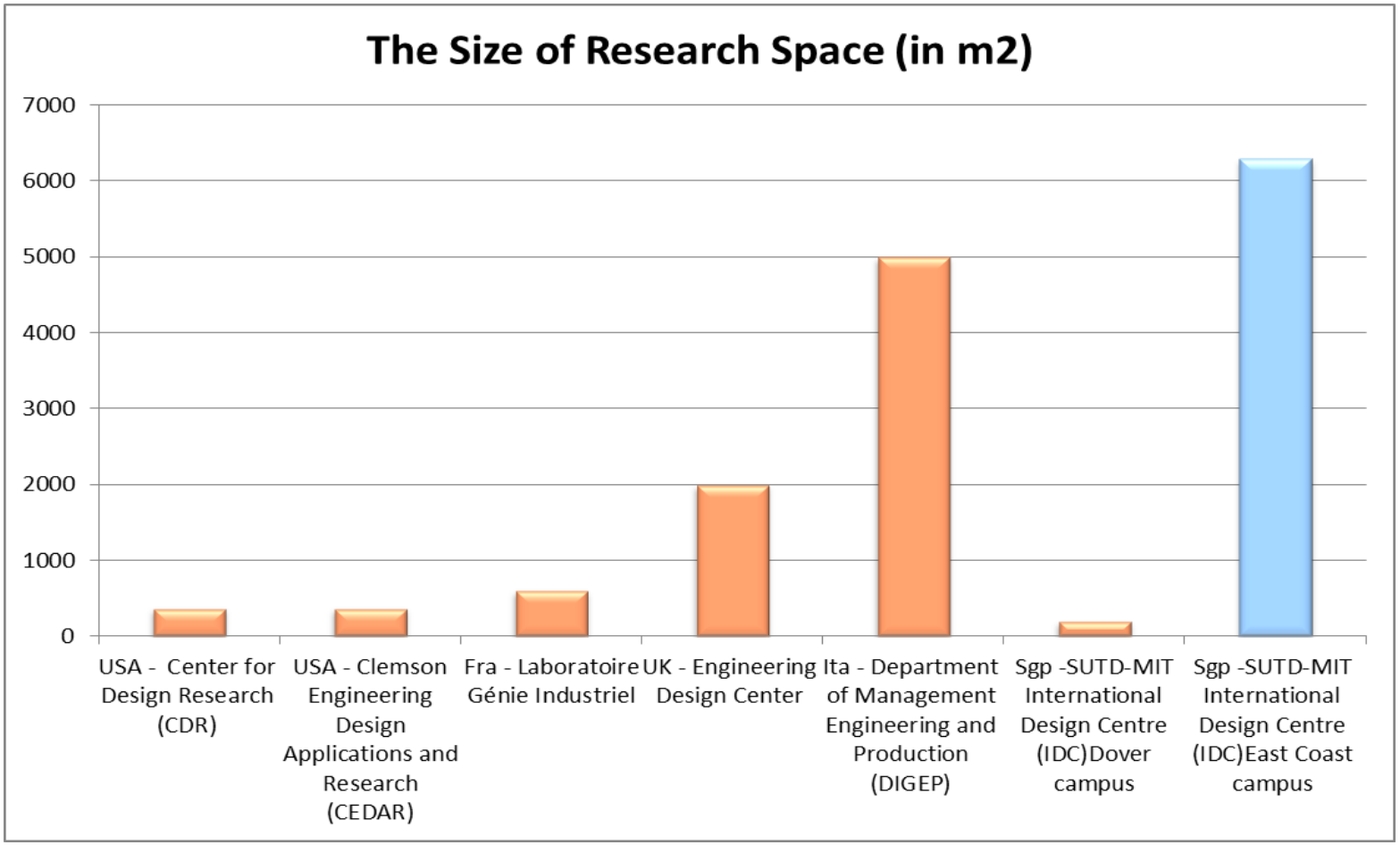

Remarks:

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