

The 3rd World Sustainability Forum: Sustainable Entrepreneurship and Sustainability Innovation



Design and the Elastic Mind www.dexigner.com image by Levent Ozler



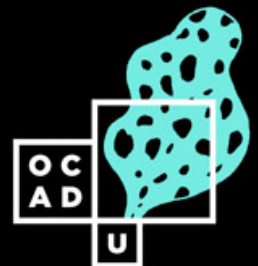
Competing Visions: the University, Innovation and Engineering after the Space Race

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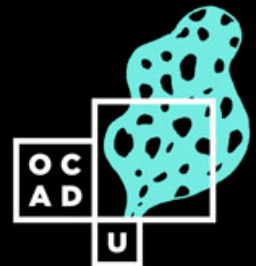
Abstract: This paper seeks to address critical elements of science, technology and the environment with a focus on the university as the economic driver of technological innovation. This paper relies on several key texts and prominent voices to present an argument based on differences of perception and expectations of outcomes within a goal of addressing engineering and design innovation as an outcome of education, while viewing engineering's bearing on perceived competitiveness within an emergent and ever more ambiguous global marketplace.



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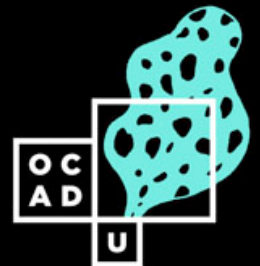
Keywords

innovation
engineering
education
design
sustainability
entrepreneurship



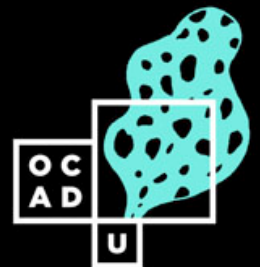
intent

place “innovation “within a broader context and use several key texts to look at innovation in engineering as it is being branded in the university today



intent

place engineering and design on a
less speculative and more historically
sound path



method

rely on several key texts and voices to present an argument based on differences of perception and expectations of outcomes using a historical survey of the engineering profession and several precedential texts, studies and research projects



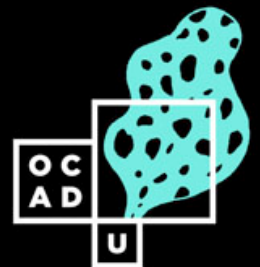
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hypothesis

innovation and its bearing on perceived competitiveness within ambiguous multinational global markets is adversely affecting the university, engineering education, design and the university as a catalyst for change and entrepreneurship



research goals

environmental dilemmas are a problem facing all universities today and presents a major shift in the role of the university's research goals in the twenty-first century, as well as the role of its faculty, students and pedagogy in general



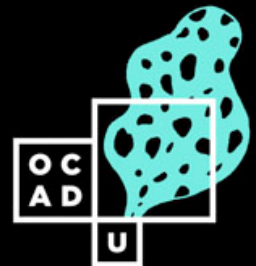
crisis mode

The university is in crisis and
innovation may not (will not) be the
panacea to all of its woes



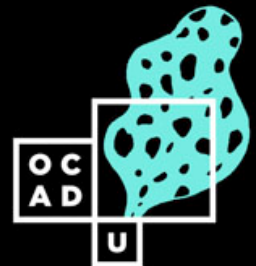
using our brains

Daniel Kahneman's *New York Times* best selling text, *Thinking Fast and Slow*, promised to show all of us how to compartmentalize our brain's processes to receive its maximum potential through an application of his theories and research based in case studies, empirical data and sound conjecture



problematization

active problem seeking and the production of cultural artifacts is based in unforeseeable future applications and, therefore, vague meanings require more depth of inquiry to cope with the greyness of our unknowable and rapidly changing ambiguous future



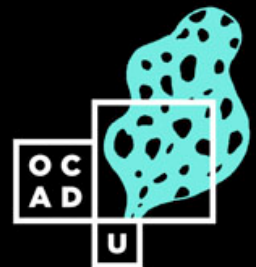
new design methods

new design methods (branded now as design research) and alternative design practices, such as visualizing quantitative data, describe potential outcomes for the repercussions of technological change in bits that can be digested and managed easily by the human brain



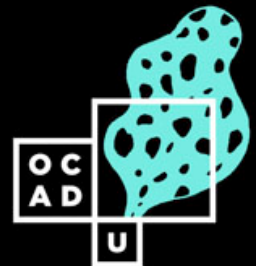
new results

these new research methods explore the latent relationships between future risks and hopeful potentials (innovation) through non-traditional means of representation, exploration and dissemination



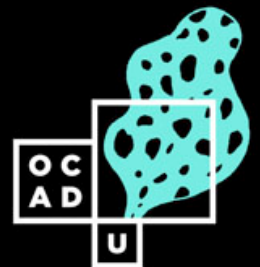
elasticity

exhibitions like *the Design for the Elastic Mind* show at the MOMA, the aestheticized art installations of Mel Chin and the endless community-based DIY projects designed by non-designers from Gujarat to Brooklyn are helping to reframe numerous problems using interdisciplinary and creative forms of inquiry shaped by the social sciences methodologically



Its all about the money

in an age when research funding, direct connections to industry and patent seeking is seen as the only way to salvage our universities and make them profitable, peripheral means of questioning represents an opportunity for deep and profound change, and more profit potentially



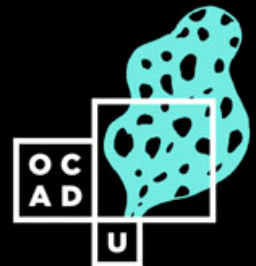
perception

we are now much wiser and have amassed a body of literature that amounts to a sea change in how we perceive technological innovation and now understand many of the ways in which technologies are cultural products embodying particular, especially historical, social interests and perspectives



saviors with slide rules

as a case study, view the engineer as
“the personification of technological
progress” as shown in Matthew
Wisnioski’s text, *Engineers for
Change: Competing Visions of
Change in 1960’s America*



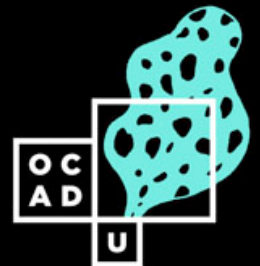
incubation

a number of “design incubators” and other entrepreneurial institutional constructs keep sprouting up in university departments as a result of cross pollination and the spirit of innovation as an abstract goal making us all engineers



attitudes and innovation

Matthew Wisnioski looks at engineering and the competing views of the profession and attitudes towards technology with a focus on the 1960's as a key historical period in which contemporary engineering practice was formed alongside its relationship to technology, intellectualism, innovation and social context for context



artscience

Harvard biomedical engineering professor, David Edwards, positions science “in the service” of art to facilitate the innovative “crossover learning,” that can “spark the passion, curiosity and freedom to pursue – and to realize – challenging ideas in culture, industry, society and research” in his contemporary spin on innovation



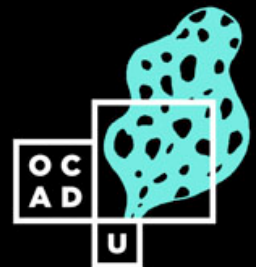
cyborgs

Edwards hypothesizes the creation of a mythic new hybrid being, an “art scientist,” who might help form “the lasting breakthroughs for the betterment of humanity” that innovation today requires



the dream

a new world of collaboration between artists and scientists in which both are equally valuable in deciphering new applications and needs for technologies with the hypothesis that the new researcher will be an a cyborg possessed by a vision for the future that is not shackled by professions, disciplines or even expertise in one area or another



precedents

key precedents for understanding pairings of art and science, particularly within the context of innovation can be seen in Harvard University's Program on Technology and Society (begun in 1968); MIT's Center for Advanced Visual Studies (of the same era); and Experiments in Art and Technology (also of the same era)



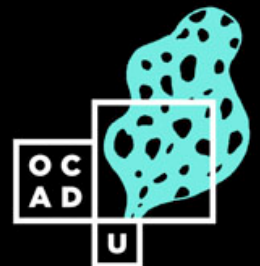
soft architecture machines

Nicholas Negroponte in his text of the same name used this specific project to report on a series of experiments by the Architecture Machine Group at the Massachusetts Institute of Technology in 1968 to 1972 meant to dive into robotics, artificial intelligence and the mystique of the design process



goals and dilemmas

Innovation, as an abstract goal tied to the evolution of appropriate and technologies, presents numerous dilemmas, as does the commercialization, industrialization or militarization of technological research



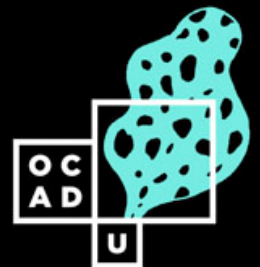
engineering at risk

engineering, as the lead profession charged with innovation through technological progress, is at risk as is its history and context of purpose



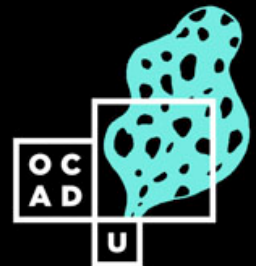
unpacking a profession

it is this transition of purpose and meaning that Wisnioski unpacks in engineering using popular culture, insider squibbling and educational reform as his tools



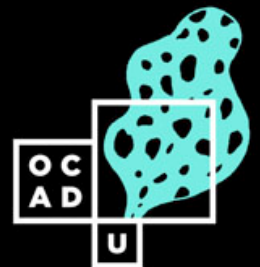
patronage was easier

If innovation in engineering wrestled with the end of the patronage of the industrial military complex in the 1960's, we are now faced in the post-communication age with an abundance of tools, an ease of dematerialization, unfamiliar business models and abstract means of monetizing experiences that we can barely recognize or be able to contextualize



pragmatics

David Edwards calls for “artscience” to rely more on the pragmatic applications of academic research that can react to global realities, like taking advantage of keeping makers and thinkers together

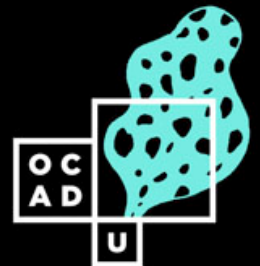


not pragmatic

this may not be so pragmatic



<http://colettesymanowitz.com/2012/09/03/celebrating-failure/>



plasticity

each discipline, on its own, does not have the tools to problematize its current condition and this may be a good thing in order to keep the university, engineering and design education and the professions alive, malleable and useful



back to Wisnioski

Wisnioski allows us to see where, when and how things went awry, perhaps now is the time to pay attention to the historical contexts that facilitate true innovation, rather than forcing the issue



Thanks!

further comments and all correspondence welcome



<http://www.cs.toronto.edu/~dmac/images/ocad2.jpg>

