

Computer Ethics and the SENCER Ideals

Connecting Students to Important Public Policy Issues

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Topics of this presentation

1. How I joined the SENCER community
2. SENCER Ideals addressed in this talk
3. A brief description of Computer Ethics
4. Example cases from Computer Ethics
5. Examples from other STEM disciplines
6. Usefulness of the *policy vacuum* idea



**David Burns, Executive Director
National Center for Science and Civic Engagement**



SENCER Ideals Addressed in This Talk

SENCER robustly connects science and civic engagement by teaching “through” complex, contested, capacious, current, and unresolved public issues “to” basic science.

SENCER invites students to put scientific knowledge and scientific method to immediate use on matters of immediate interest to students.

SENCER, by focusing on contested issues, encourages student engagement with “multidisciplinary trouble” and with civic questions that require attention now.

What Is Computer Ethics





James H. Moor, Dartmouth College

“What Is Computer Ethics?” — 1985



Logical Malleability!

Hardware and software can be adjusted to do almost any task that can be divided into simple logical steps.

This means that computing technology is almost a universal tool that can do nearly any job!

“The only limits of computing appear to be the limits of our own imagination!” ... Moor

Policy Vacuums!

Information technology makes new things possible — things that could never be done before. Since they could not be done before, there may be no laws against them and no standards of good practice.

Just because we can do something, that does not mean that we ought to do it!

The Two Primary Activities of Computer ethics

**Analysis of the nature and social
impacts of computer technology**

**Corresponding formulation and
justification of policies for the
ethical use of such technology**

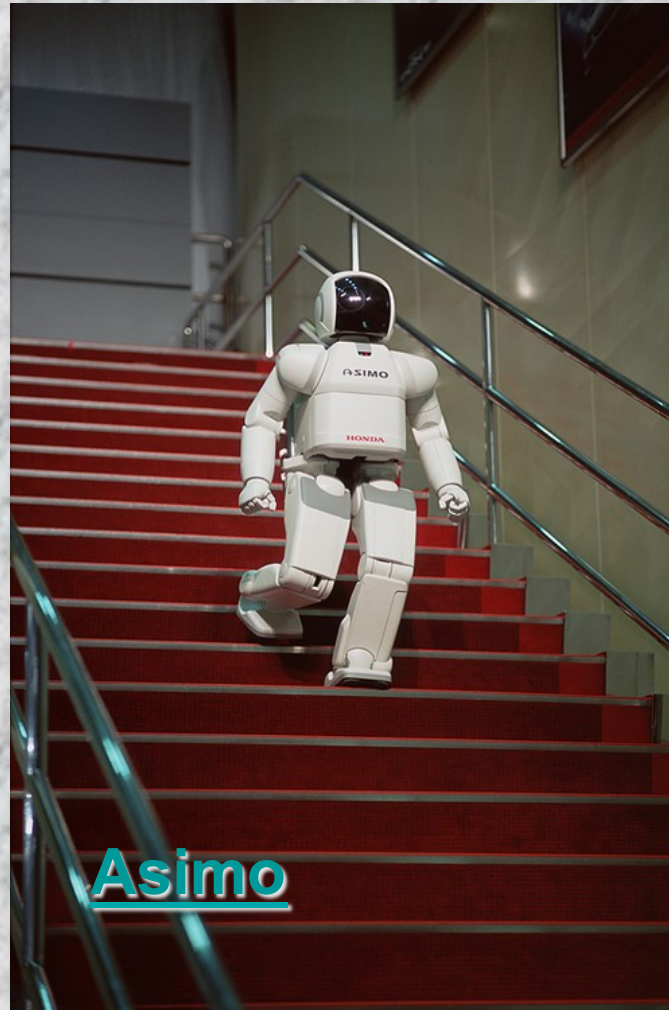


Consider Robot Ethics

**By 2025, there will be more robots
in the world than human beings!**

Here are some robot examples:





Asimo





Big Dog





Robot Gull





Paro Baby Seal Robot





Dragon Fly Robot



RoboBee





Users of mobile apps worldwide by region 2012-2017 according to Portio Research

	2012	2013	2017
App users worldwide	1.2 billion	N/A	4.4 billion
Asia Pacific	30%	32%	47%
Europe	29%	28%	21%
North America	18%	17%	10%
Middle East & Africa	14%	13%	12%
Latin America	9%	10%	10%
Source: © Portio Research (March 2013)		via: © mobiThinking	

Forbes: “13.4 Billion App Downloads, \$2.2 Billion Revenue in Quarter 1, 2013” (April 2013)

\$200 Billion Revenue per year by 2020!



Apps for nearly everything!

Business

Leisure

Health Care

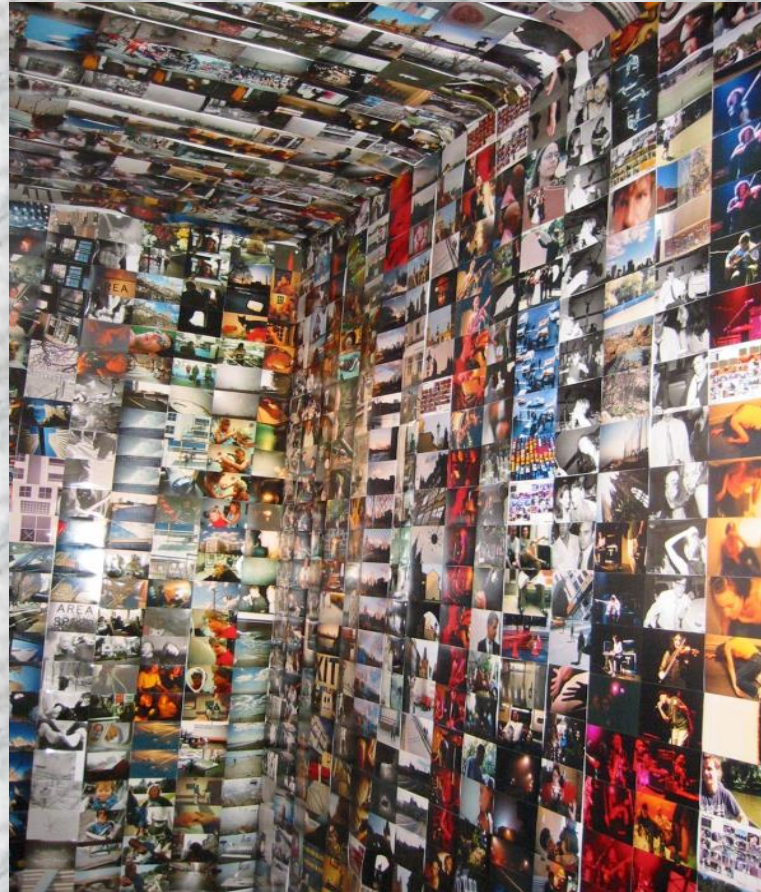
Entertainment

Education

Warfare

Science

Etc., etc., etc.

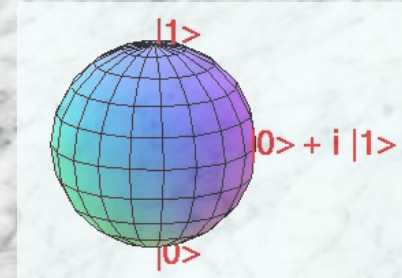


37% of people now spend more time using Apps than surfing the web or watching TV!

Apps generate many, many Moorian “policy vacuums” regarding issues such as **privacy, **unemployment**, **security**, **human psychology**, **ownership of intellectual property** and more!**

Quantum Computing!

A “qubit” can, at the same time, represent a 1, a 0 and an infinite set of numbers in between.

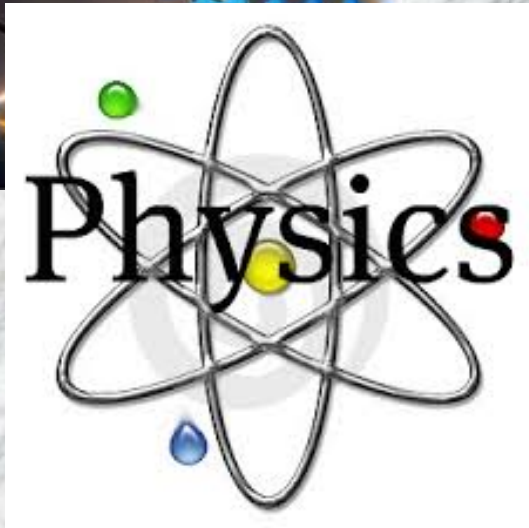
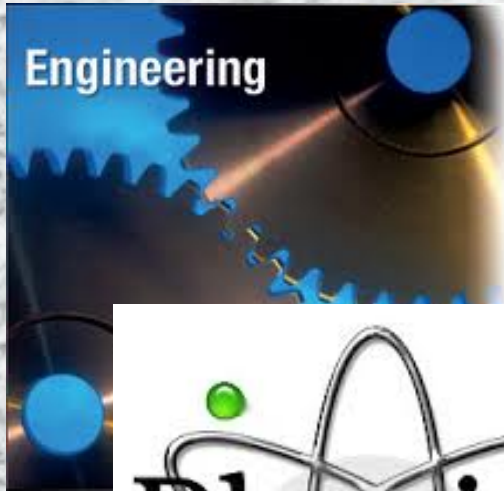


Theoretically, a quantum computer with only 10 qubits can do 1,024 things at once; one with 20 qubits can do 1,048,576 things at once. A quantum computer with 300 qubits, theoretically, can do more things at once than all the elementary particles in the universe!

Imagine a robot with a 300-qubit quantum computer for a “brain”! The number of policy vacuums is staggering!

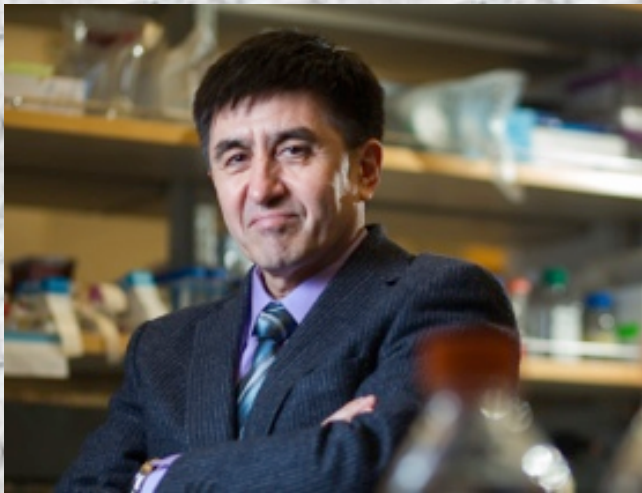


Examples from Other STEM Disciplines



Biology

Three Biological Parents!



Shoukhrat Mitalipov
Oregon Health and Science University.



Rhesus Monkey



Chemistry



Systemic Pesticides!

Physics

Splitting the Atom

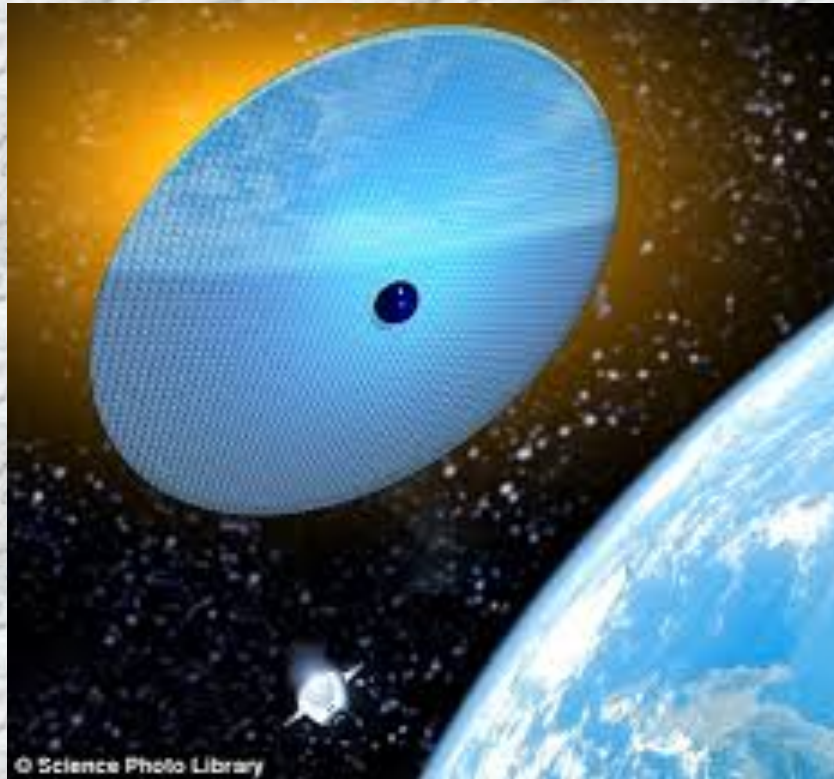


Cold Fusion?



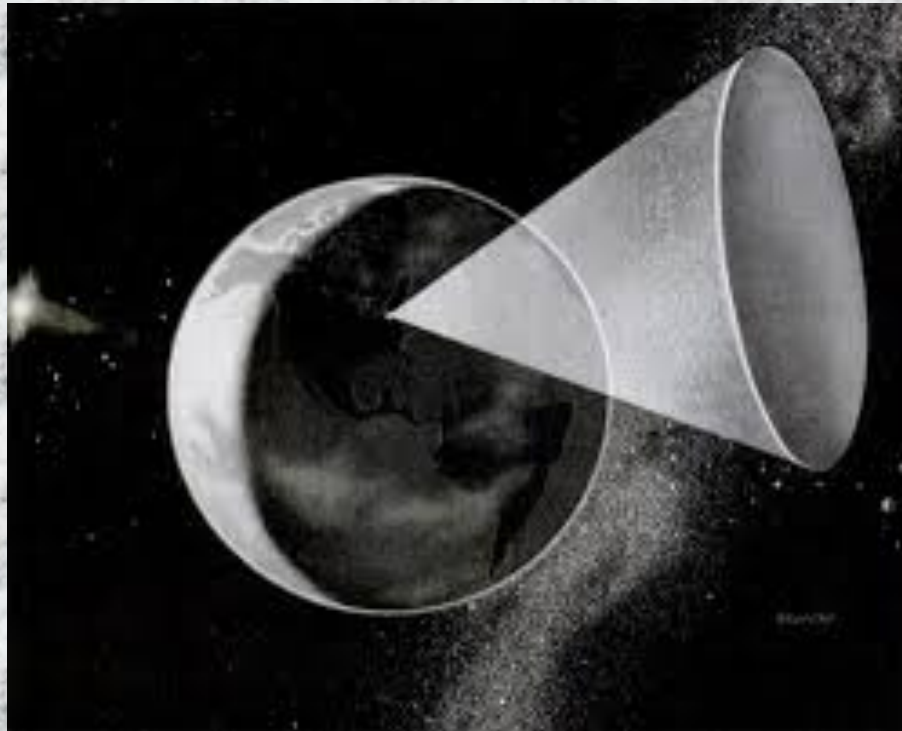
Engineering

Giant Space Mirror



Engineering

Giant Space Mirror



Concluding Remarks

The **SENCER-Ideals-promoting** notion of a “policy vacuum” is remarkably helpful in Computer Ethics!

It enables students to grasp, quickly and effectively, significant public policy issues generated by – or *likely* to be generated by – new developments in information technology and computer science.

Conclusion

Similar SENCER-Ideals-promoting results can be achieved by applying the concept of “policy vacuums” to new developments in all STEM disciplines!





Thank You



