



Ivan Sutherland

**Engineering Seminar Program
Wednesday, March 24, 2010
Galileo McAlister 4:15 p.m.**

Ivan Sutherland is a Visiting Scientist at Portland State University where he and Marly Roncken have recently established the "Asynchronous Research Center" (ARC).

The ARC occupies both physical and intellectual space half way between the Computer Science (CS) and Electrical and Computer Engineering (ECE) departments at Portland State. The ARC seeks to free designers from the tyranny of the clock by developing examples, tools and teaching methods for design of self-timed systems. Prior to moving to Portland, Ivan spent 25 years as a Fellow at Sun Microsystems. A 1959 graduate of Carnegie Tech, Ivan got his PhD at MIT in 1963 and has taught at Harvard, the University of Utah, and Caltech. Ivan holds a Turing Award and is a member of both the National Academy of Engineering and the National Academy of Sciences.

Engineering Skill is Not Enough

by Ivan Sutherland, Portland State University

What we can build depends on available materials.

We couldn't build long suspension bridges without high strength steel cables.

What we can build depends on prevailing conditions.

Cedar shake shingles are great in New England but they dry out and wither in Arizona.

What we can build depends on our design tools.

The first stealth fighters had only flat surfaces because no one could compute radar returns from curved surfaces.

What we can build depends on what society permits.

You may not build a factory in a residential area.

What we can build depends on the vision of financial backers.

The "Chunnel" under the English Channel was a pipe dream until enough people were willing to invest in it.

What we can build may depend on national pride.

The US space program became real only after Sputnik.

What we can build depends on how we organize.

The U-2 spy plane took only 18 months from start to first operational flight.

What we can build depends on our collective knowledge.

We gather new knowledge from failure and by organized search.

How can we build things that have never been built before?

We find a purpose. We find a market. We find knowledge.

We make tools. We gather financial backing. We organize teams.

And only then can we build. But to succeed we must also have a sales organization, customers, and make a measurable financial return.

Our skill as engineers may be essential, but it's only a small part of a much bigger whole.