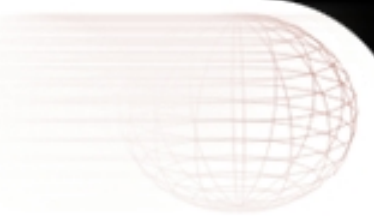




# Agriculture, Environmental Science, and Information Technology

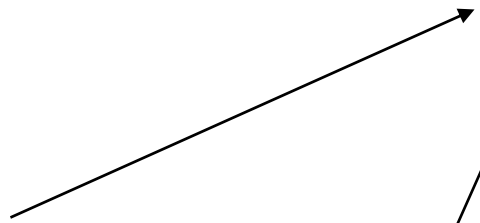
Fedro S. Zazueta  
Professor and Director  
Academic Technology Office  
University of Florida

# Cultivation of the fields

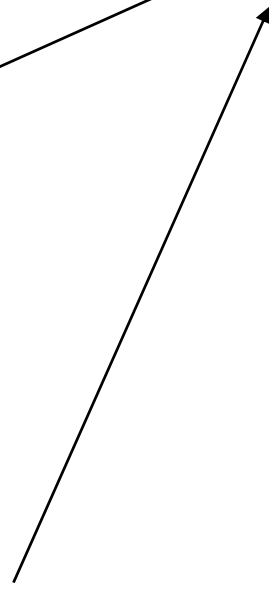




Water



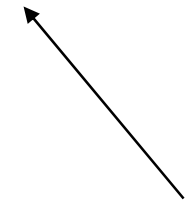
Atmosphere



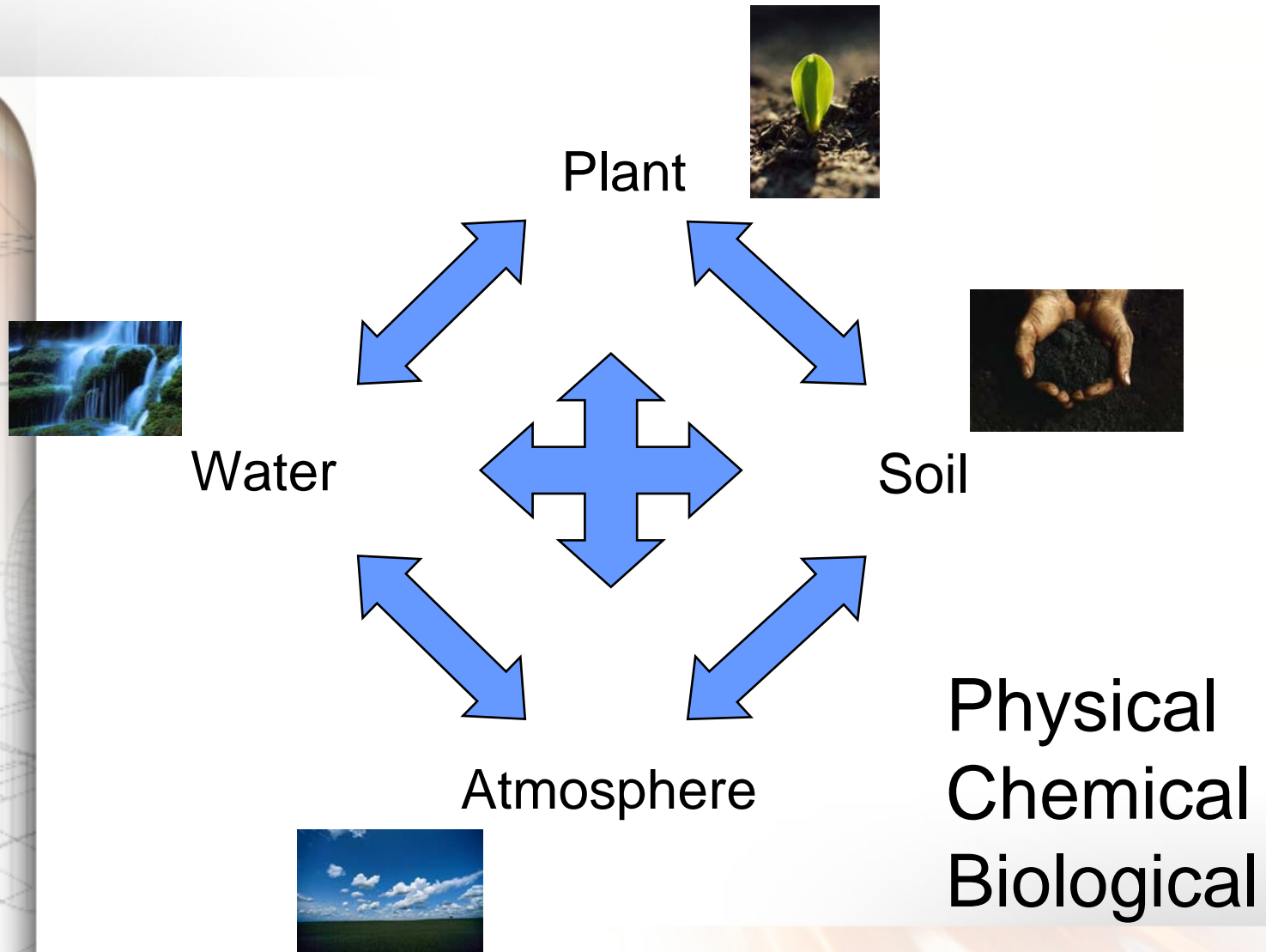
Plant



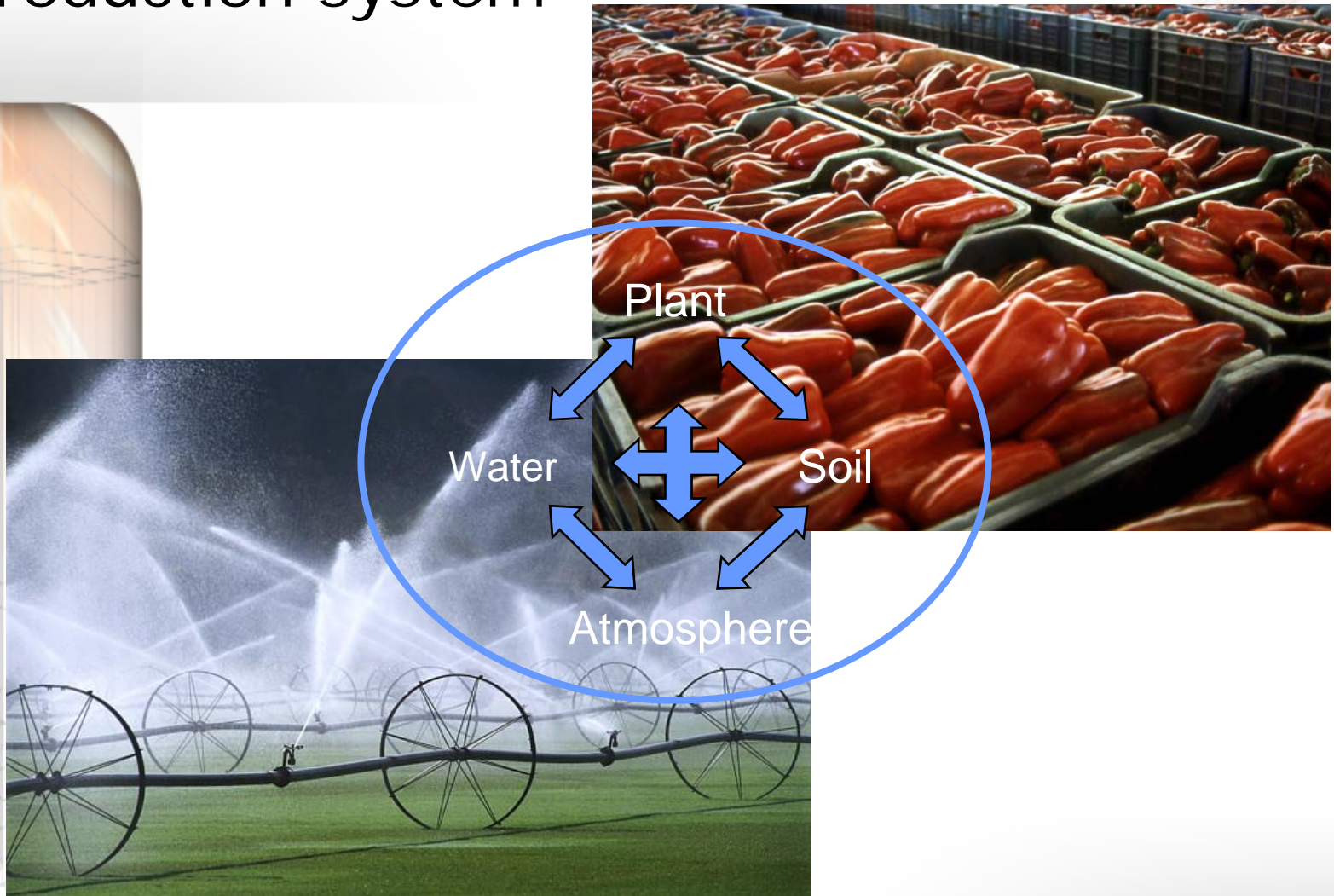
Soil



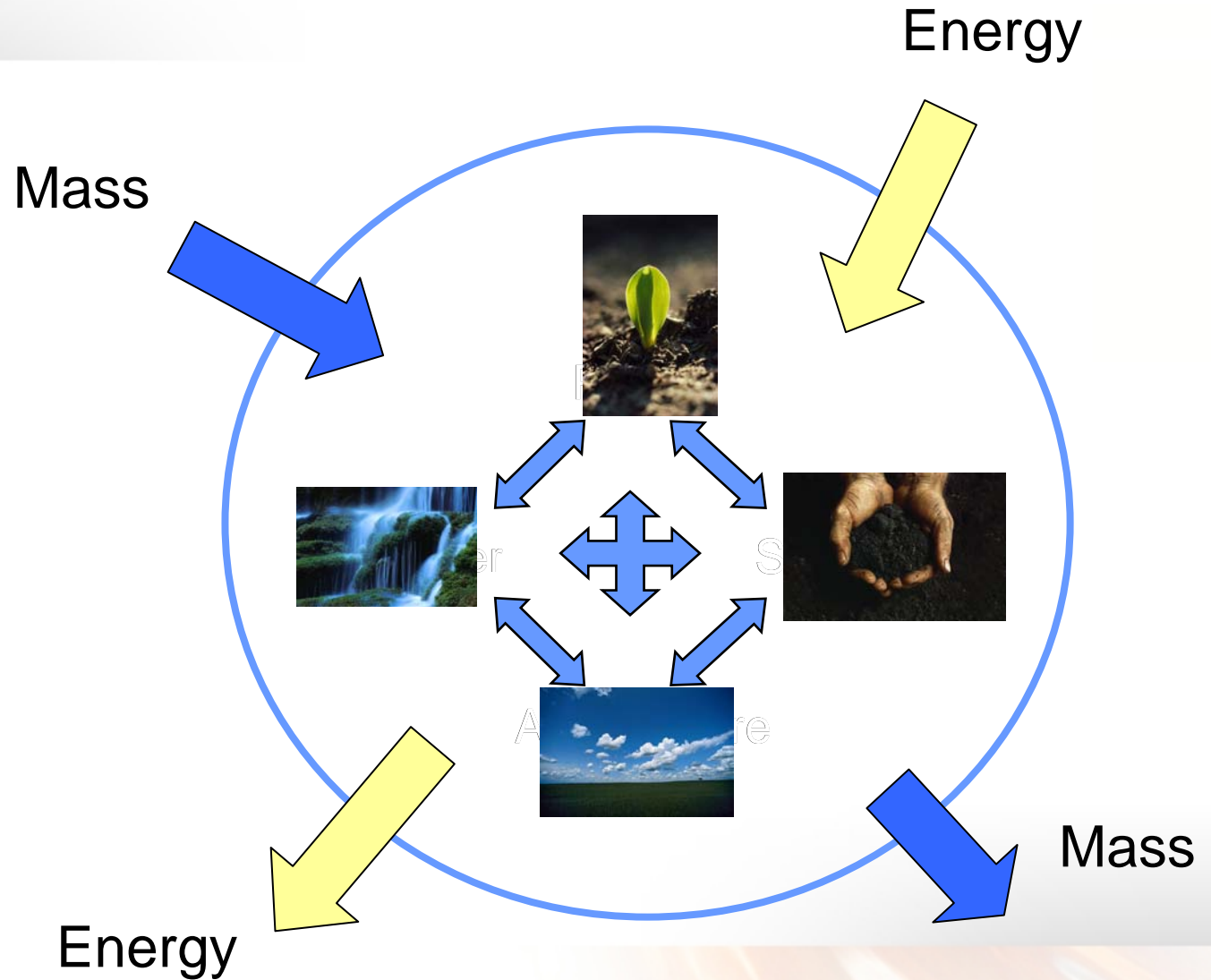
# Agriculture as environmental production system



# Agriculture as environmental production system

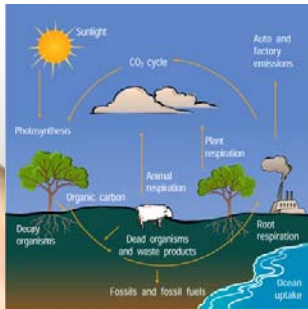


Agricultural production systems are open.

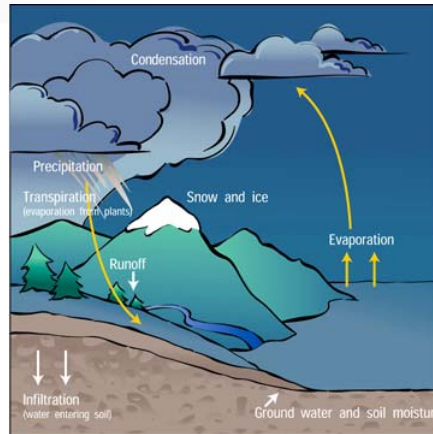




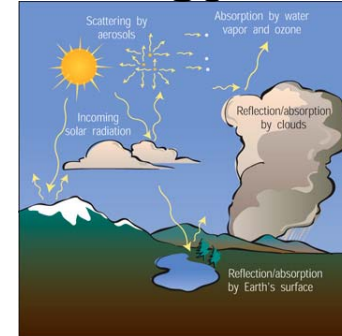
# Carbon



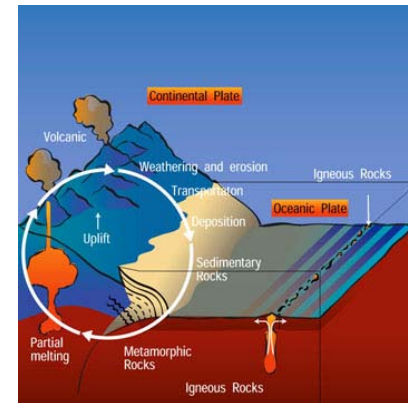
# Water



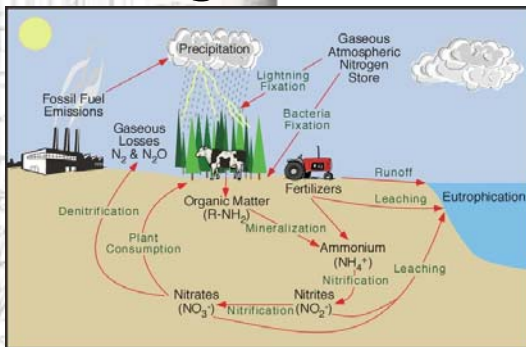
# Energy



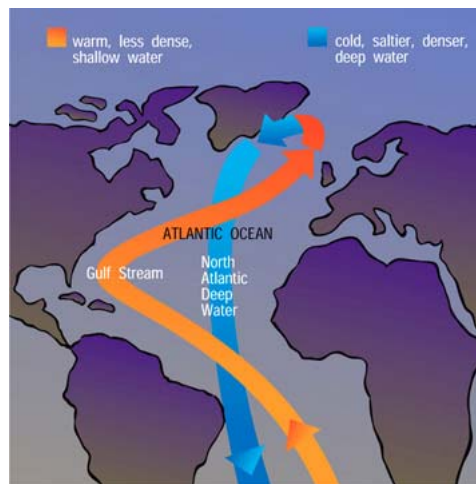
# Rock



# Nitrogen

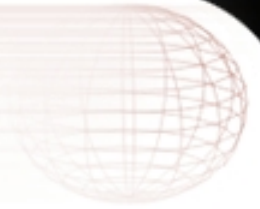


# Sea

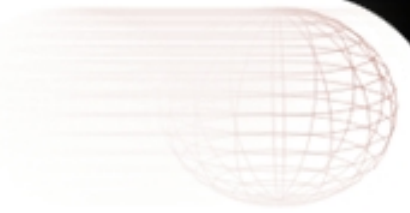




Making decisions and taking actions in a complex sustainable production system.



# The Land Grant University



- Create Knowledge
- Preserve Knowledge
- Transmit Knowledge

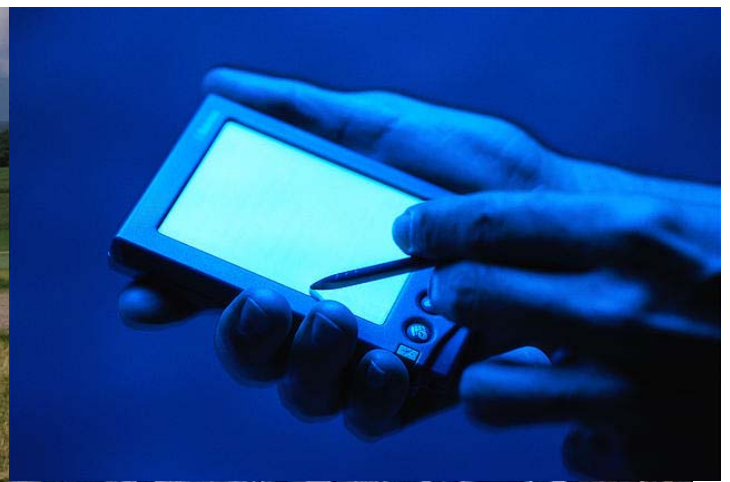
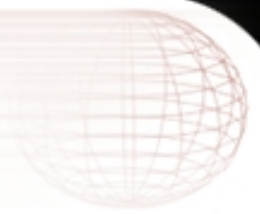


# Technology for the XXI Century

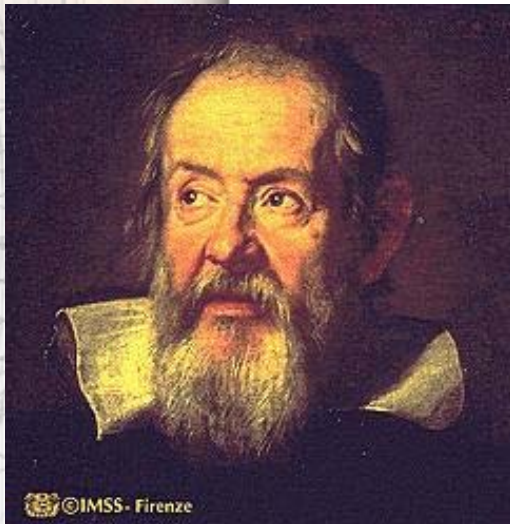
- Information related technologies
- Biology related technologies



# Technology and Social Transformation

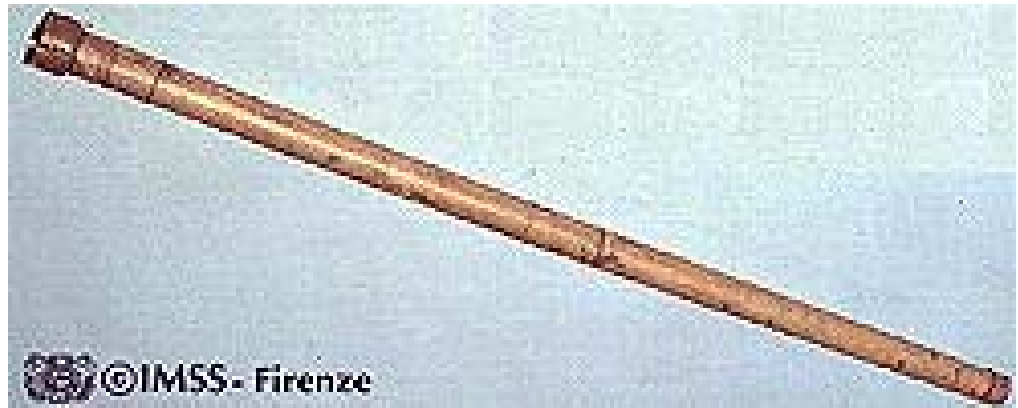


# Technology as a Transformation Agent



©IMSS - Firenze

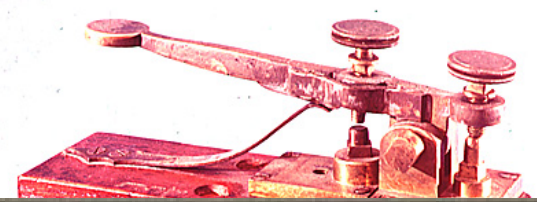
[galileo.imss.firenze.it](http://galileo.imss.firenze.it)



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[galileo.imss.firenze.it](http://galileo.imss.firenze.it)

# Tecnology and old Paradigms

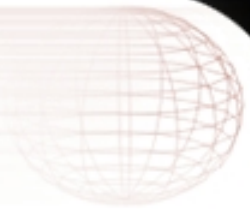


## Men Wanted!!

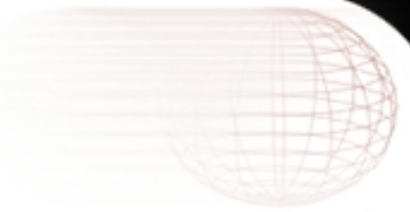
THE UNDERSIGNED WISHES TO  
hire ten or a dozen men, familiar with the  
management of horses, as hostlers or  
riders on the Overland Express Route via  
Salt Lake City. Wages \$50 per month  
and found. I may be found at the St. George  
Hotel during Sunday, Monday and Tuesday.

William W. Finney

# Appropriate Use of Technology



# Lessons on Technology



- It is a change agent
- Change is inevitable
- Use is paramount
- Transforms our world vision



# Transformation



- Improve what we did in the past
- Do what we could not do before

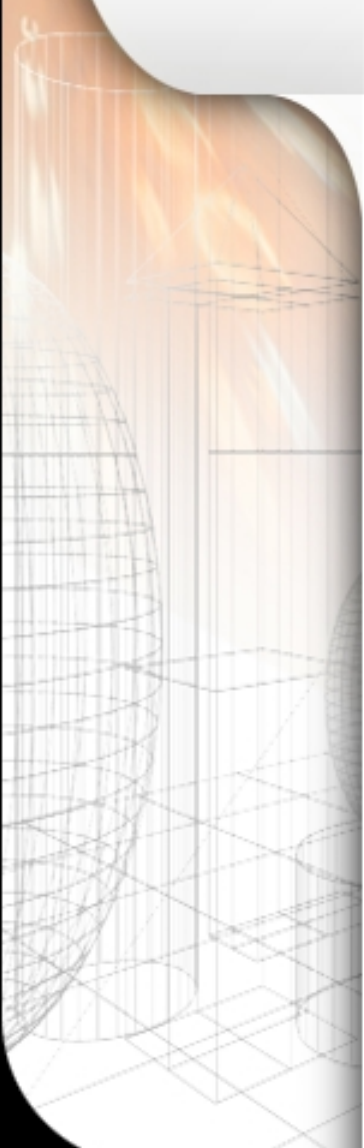
# Transformation



- Deliver timely knowledge to stakeholders
- Transform management

# Extension Information Management



- EDIS
    - A single comprehensive source for extension information.
  - Started 1982
    - Object Oriented Technology
    - Artificial Intelligence
- 

Florida Agricultural and Natural Resources Information

Title: Uses of Water in Florida Crop Production

Author:

DL Number: XX-000 IFAAS Number: AE001

Department: Agricultural and Biological Engineering

Created: 2/6/00

Review:  /  /  M

Expires:  /  /  M

Edit Search Tools

Water Use Efficiencies (Eu)

In water management, the term efficiency generally relates

C:\My Documents\Presentations\1999 Horticulture Agents Meeting\IFAS Pubs from edis\W1005.htm - Microsoft Internet Explorer

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File Edit View Favorites Tools Help

Address C:\My Documents\Presentations

Acrobat Reader - [W1015.pdf]

File Edit Document View Window Help

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AE265

EXTENSION

Institute of Food and Agricultural Sciences

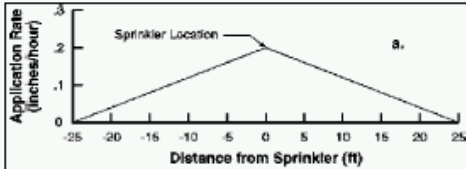
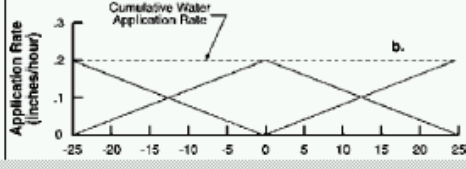
**Turf Irrigation With a Hose and Sprinkler<sup>1</sup>**

F.S. Zazueta and Grady Miller<sup>2</sup>

Irrigating with a hose and sprinkler can be equally or more efficient than irrigating with a professionally designed irrigation system. All it requires is some understanding of how an irrigation system works, and committing the time and effort needed to make good use of a sprinkler and hose.

**How do sprinklers work?**

Although in Florida we receive enough rainfall to meet turfgrass water needs, only a small fraction of it is effective. Its distribution over time and the low capacity of our soils to hold water result in most of rainfall being lost to runoff or percolation. Sprinklers are a tool to supplement water during periods in which not enough rainfall occurs.

Application Rate (inches/hour)

Distance from Sprinkler (ft)

Application Rate (inches/hour)

Distance from Sprinkler (ft)

113% 1 of 5 8.5 x 11 in

Whole Document Navigator

UNIVERSITY OF FLORIDA

Cooperative Extension Service  
Institute of Food and Agricultural Sciences

**Valves in Irrigation**

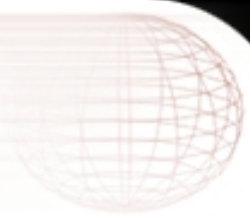
Dorota Z. Haman, Forrest I...

The term "valve" applies to a control, modulation of the flow pressure relief or as a safety sophisticated control equipment to the system.

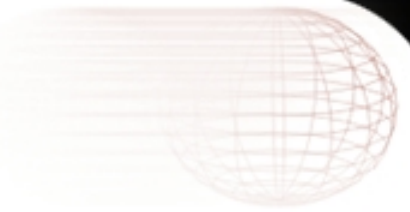
ON-OFF SERVICE

Load Next

HTML Print

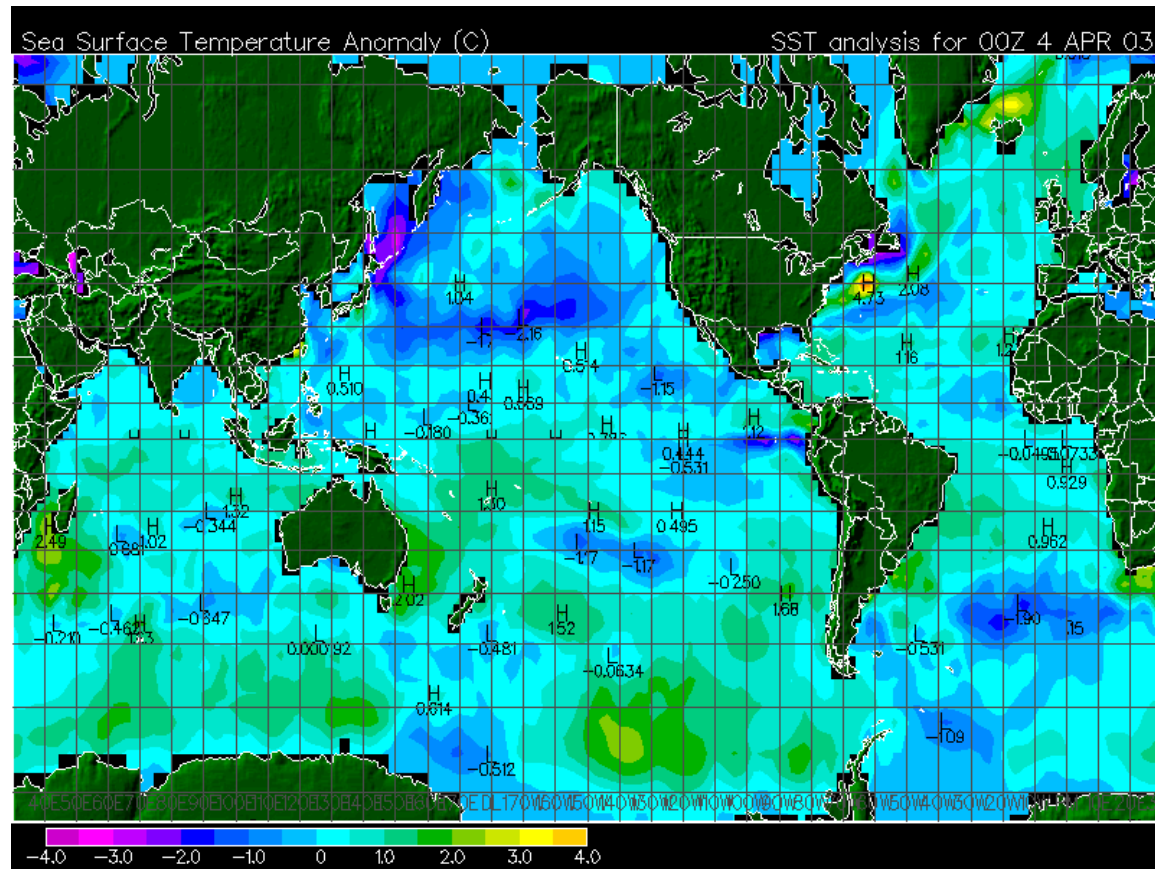
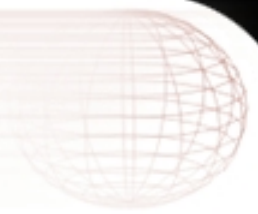


# Lesson Learned



To make effective use of technology the business process must change (change the paradigm).

# Global Climate Modeling



# Collaboration Among

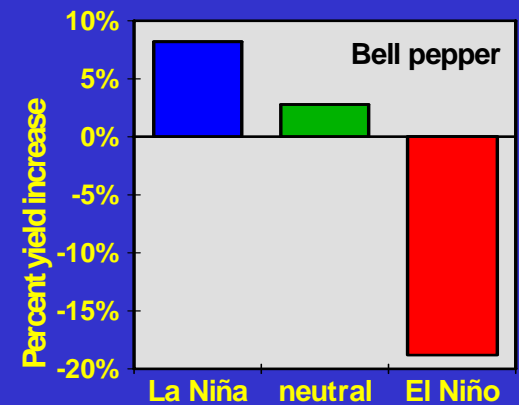
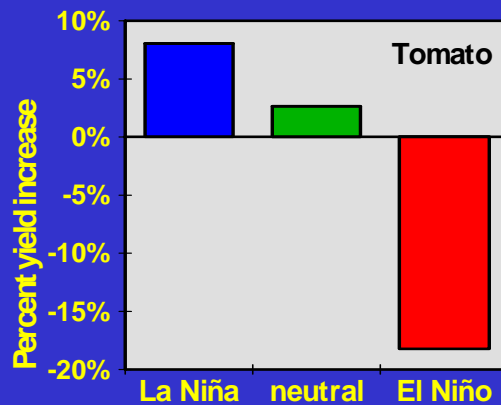
- Argentina
- Costa Rica
- México
- USA



# Fresh Vegetables:

## Winter Tomato and Bell Pepper Yields (1929-95)

- Yields suppressed during El Niño

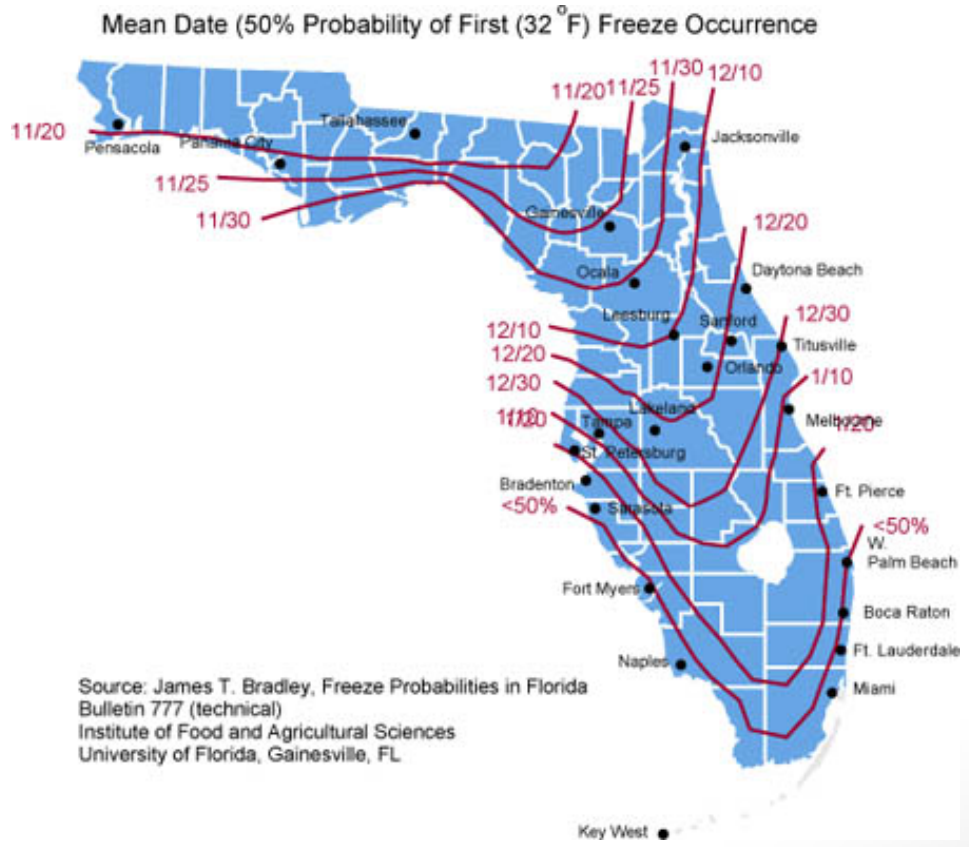
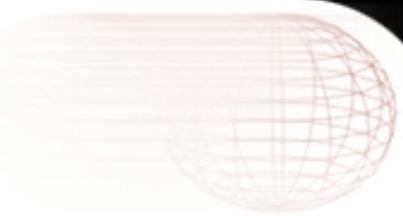




# Damage Produced by el Niño in Florida (1/12/97 a 2/22/98)

Crop Production	\$140,000,000
Animal Production	\$183,500,000
Forestry	\$493,000,000

# Models





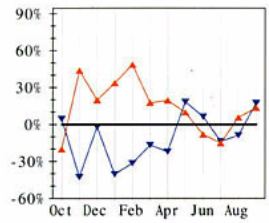
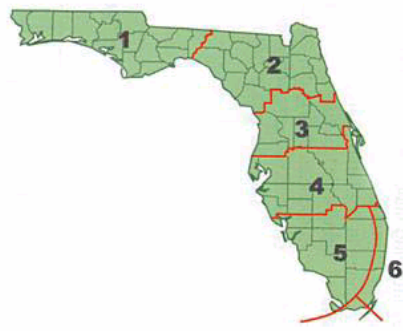
### El Niño, La Niña, & Florida's Climate: Effects on Agriculture and Forestry

A *Florida Consortium* Report

#### Rainfall Anomalies

Mouse over any zone in the Florida map to view a graph of rainfall anomalies for that zone. Graphs show percentage difference from normal precipitation.

On the graph, red lines signify El Niño years, green lines show neutral years, and blue lines La Niña years.



[Discussion of El Niño, La Niña and precipitation](#)

[Return to table of contents](#)



Questions or comments? Email [The Florida Consortium](#).

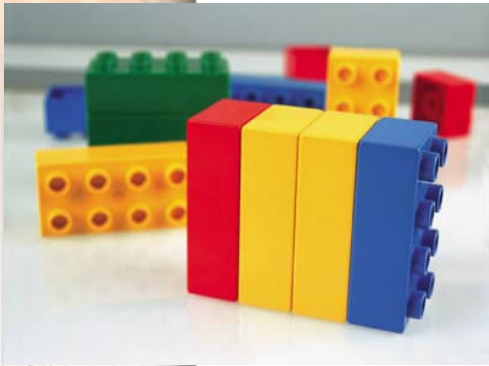
# Example Benefits



## Potato

- 1997-98 Winter Growing Season, South Florida
- 100% losses by farmers who did not form their fields, clean ditches for increased drainage
- High yields by those who did increase drainage

# Learning Object(LO)



Any module or entity digital or non-digital that can be used, reused or accessed during learning.

SCORM  
Dublin Core  
And many more...

# The Need for Rapid Prototyping of LOs

- Centrally managed resource
- Shelf life
- Reusability

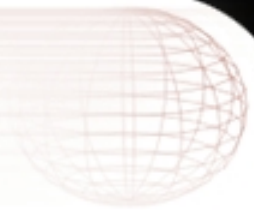


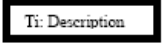
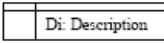
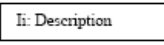
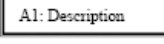
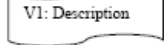
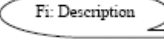
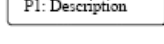

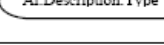
# The Opportunity for Rapid Prototyping of LOs at University of Florida

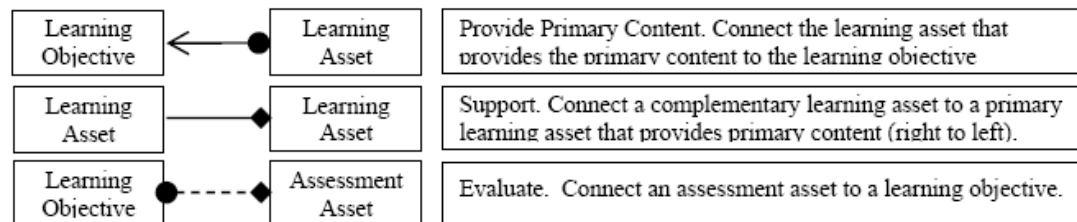
- **Ontology based DB** (Howard Beck)
- **Adaptive Instruction** (Stanley Su)
- **Invested in Technology** (Fedro Zazueta)



# Ontology



Symbol	Asset Type	Shorthand	Definition
	Text	$T_i$	A block of text describing a concept.
	Diagram	$D_i$	A line diagram usually consisting of an abstraction of a complex system.
	Illustration	$I_i$	An illustration, generally used to complement or reinforce another asset.
	Activity	$A_i$	An activity related to the subject matter used to illustrate, reinforce, or discovery of a concept by the student.
	Video Clip	$V_i$	A video clip.
	Animation	$F_i$	An animation.
	Problem Statement	$P_i$	The statement of a problem
	Problem Solution	$PS_i$	The solution to a given problem statement
	Assessment question and type	$A_i$	An item used in the assessment of the student and its type (True/False, multiple choice, numerical problem, essay, etc.)





# LO

Meta Tags
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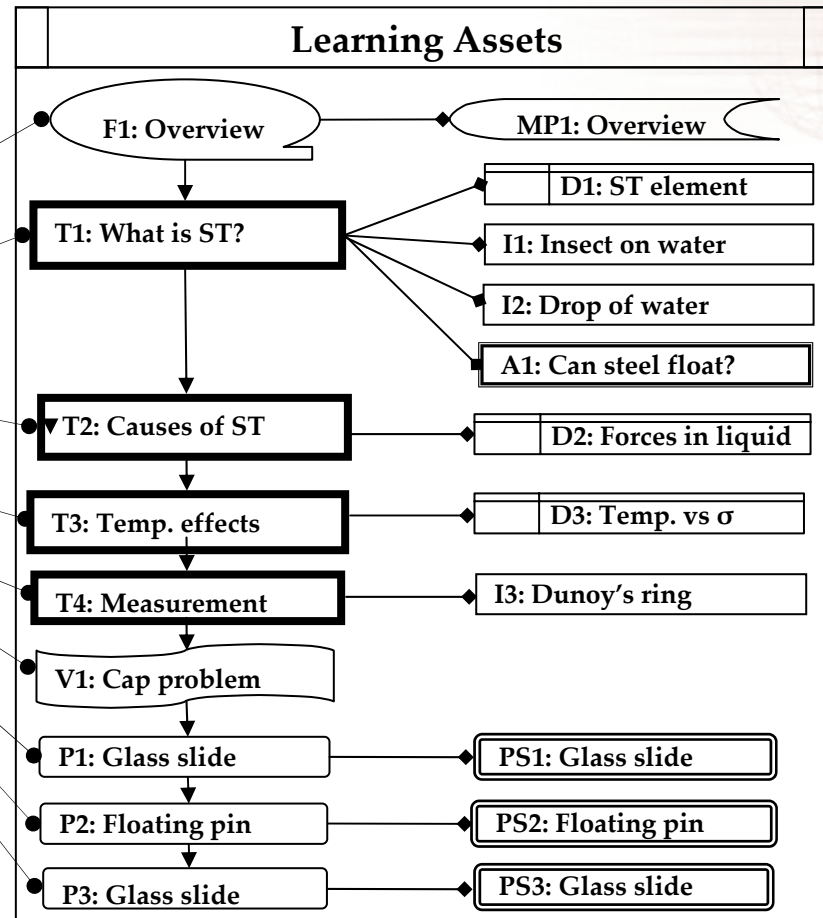
Learning Objectives
---------------------

- LO1: Describe ST phenomenon
- LO2: Define  $\sigma$
- LO3: Describe causes
- LO4: Explain temperature effects
- LO5: Solve statics problems

Study/Guidelines
------------------

T3: Study/Guidelines
----------------------

Quality survey
----------------



Assessment	
◆ A1: $\sigma$ is measured in units of.....	T/F
◆ A2: ST between a liquid air interface is.....	T/F
◆ A3: ST is caused by.....	T/F
◆ A4: Factors that effect ST are.....	MCH
◆ A5: $\sigma$ of a liquid decreases when .....	T/F
◆ A6: $\sigma$ of water is higher than most other liquids.....	T/F
◆ A7: Select the best sentence that describes.....	MCH
◆ A8: Calculate $\sigma$ for a Dunoy/ Experiment.....	PT/F

# Implementation of the LO

Surface Tension - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address [http://fsz.ifas.ufl.edu/surfacetensionandcapillarity/en\\_index.htm](http://fsz.ifas.ufl.edu/surfacetensionandcapillarity/en_index.htm) Go

## surface tension

VIDEOS | DIAGRAMS | ILLUSTRATIONS | CALCULATIONS

### INDEX

HOME  
SURFACE TENSION  
CONTACT ANGLES  
TENSIOACTIVE MATERIALS  
CAPILLARY RISE

### ABOUT THIS PROJECT

VERSION EN ESPAÑOL  
TECHNICAL REQUIREMENTS  
BIBLIOGRAPHY  
CREDITS

UNIVERSITY OF FLORIDA

W3C CSS ✓  
W3C HTML 4.01 ✓

### Bienvenido!

In this web page you will find information related to surface tension, contact angles, tensioactive materials and capillary rise.

### Overall Objectives

Using this resource, the student shall:

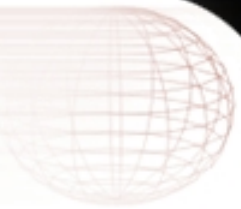
- Explain the causes of the surface tension phenomenon
- Explain the connection between surface tension and capillarity
- Recognize the effects of surface tension and capillarity in agricultural systems


### Technical Requirements

- This project includes interactive elements that require Flash Player 6.0. If you do not have this plug-in you can download it at no cost from [Macromedia Flash](#)
- This project also includes documents that you can download to your computer, view and print using Adobe Acrobat Reader. You can download this software at no cost from [Adobe](#).
- Videos in this project were developed using QuickTime. To derive the best benefit from these materials you must have the most recent version of QuickTime. If you do not have it installed in your machine you can download it from [QuickTime](#).

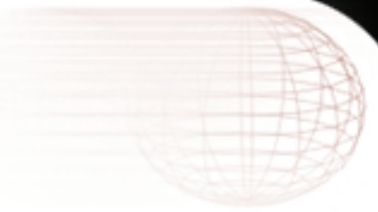
START HERE

# Methodology for the Production of the Learning Objects (Sepulveda)



- Based on Curriculum Taxonomy
  - Learning Objectives (Bloom's Taxonomy)
  - Learning Styles
  - Assessment
  - Rapid development
  - Reduced cost
- 

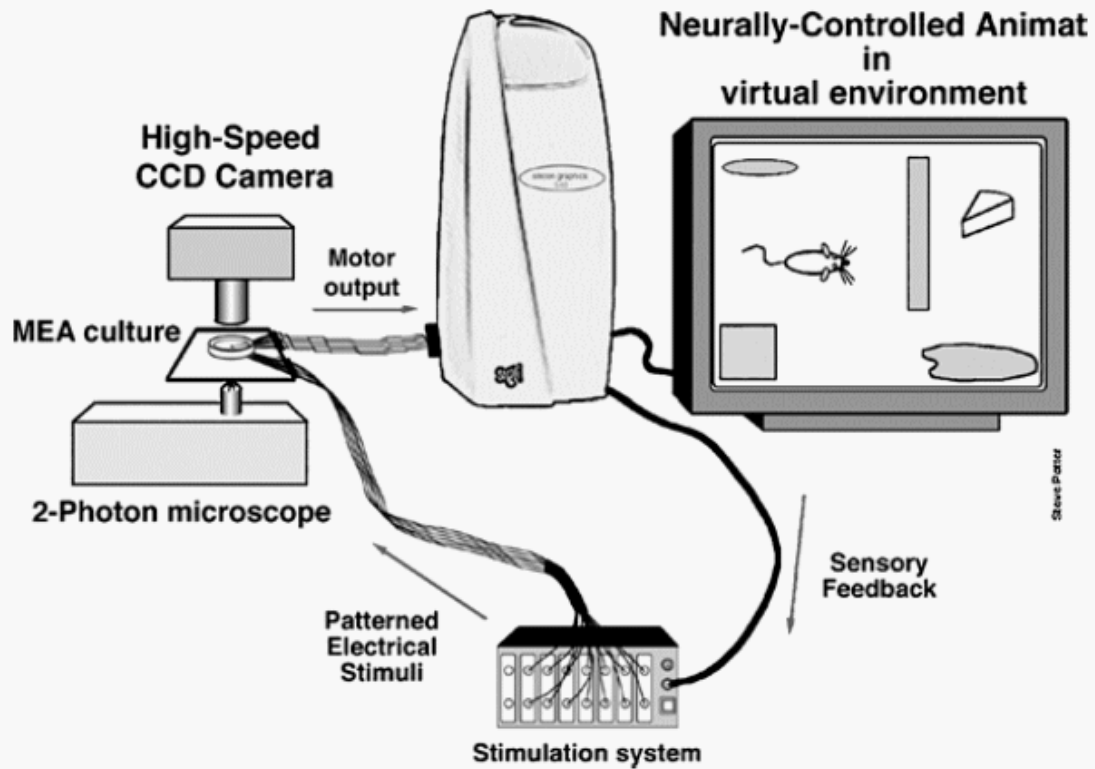
# Technology for the XXI Century

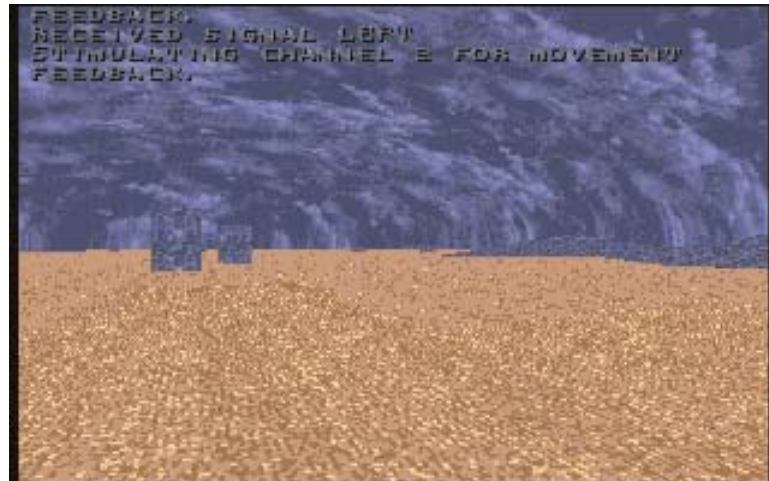
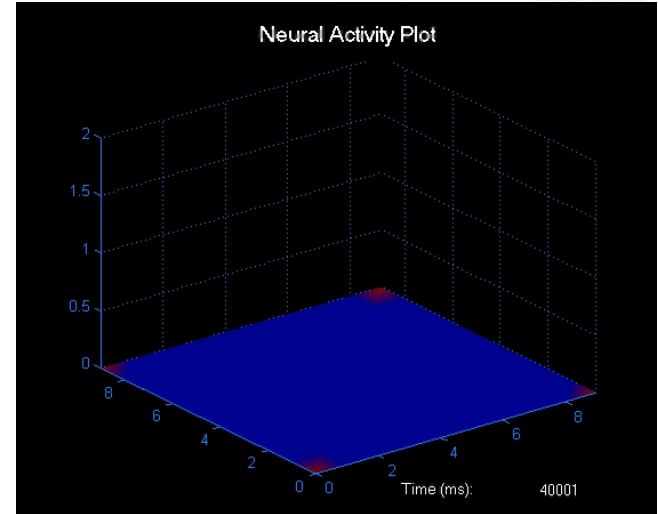
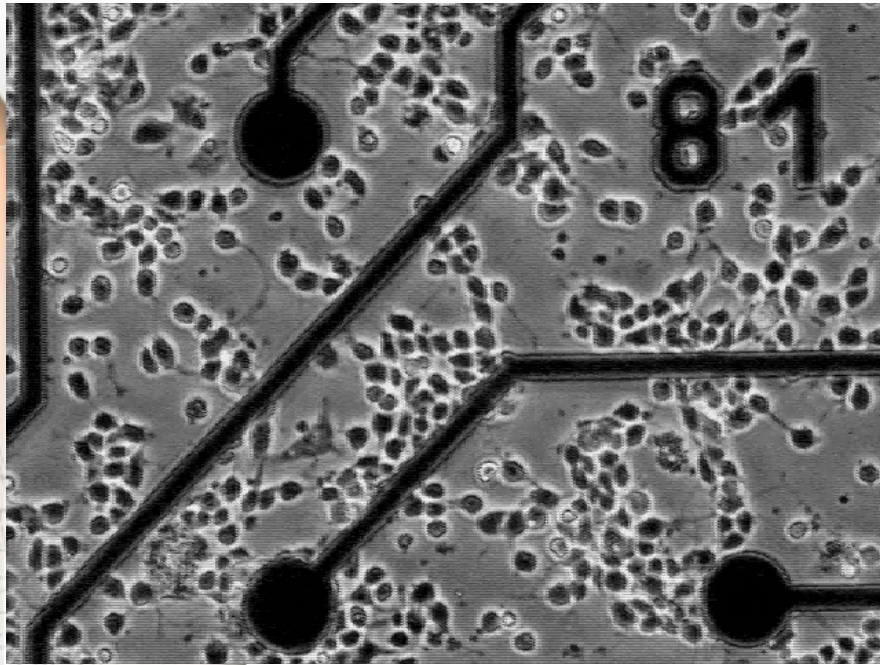


- Information related technologies
- Biology related technologies

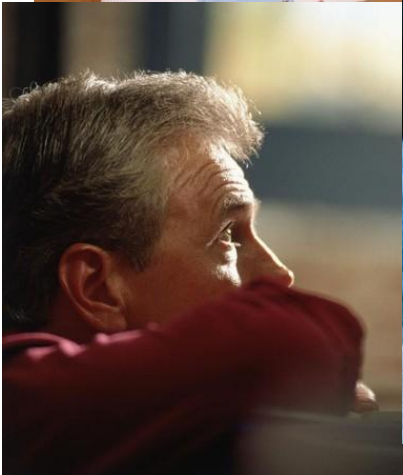
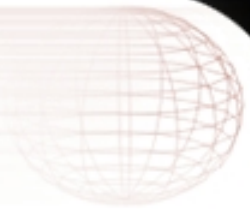


# Automats

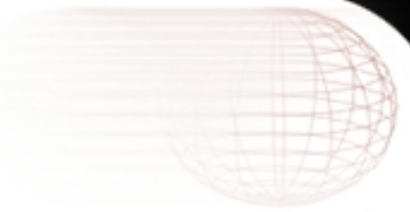




# Times of Change



# Beyond Novelty...

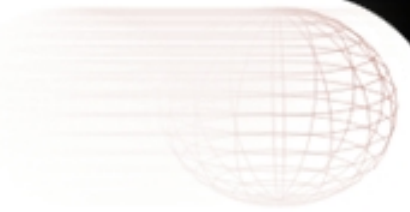


## Context

- Social needs
- Technology evolution
- Resource availability
- Transfer and adoption
- Sustainability

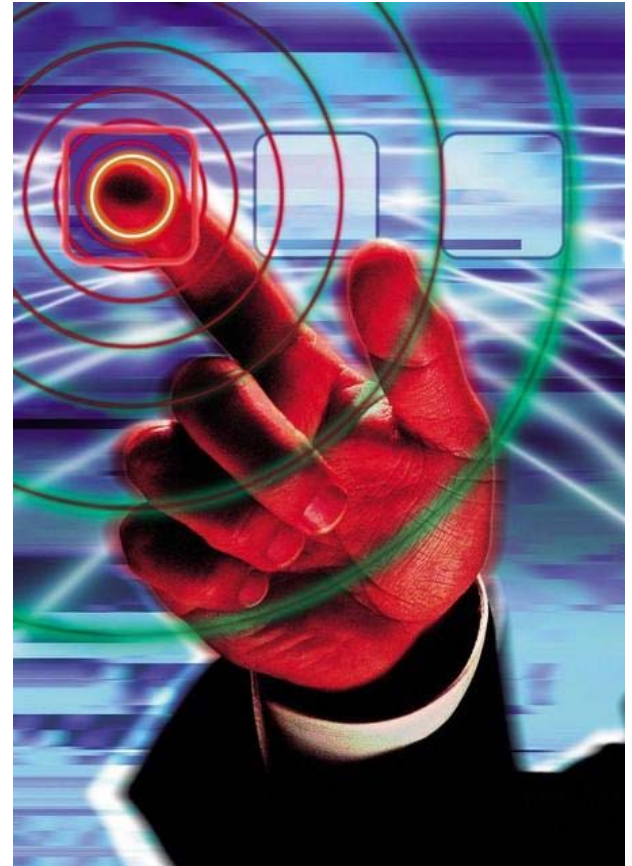
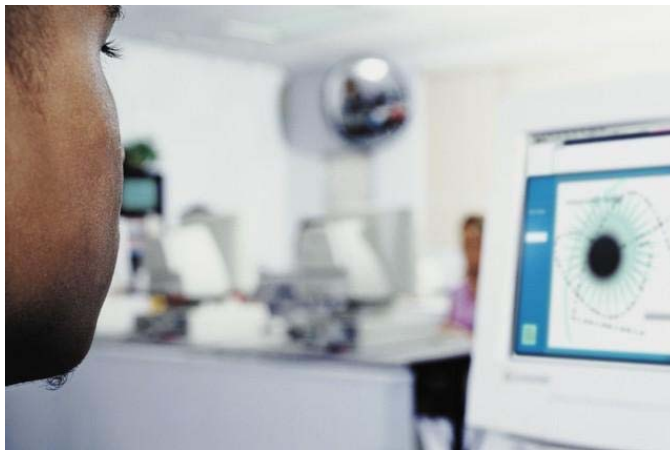
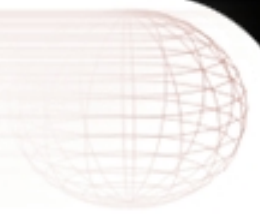


# Where are we going?



Investments we make  
Acceptance  
Adoption  
Rejection

# It's a Social Choice



Thank you!

