1. My Story
2. Agriculture Context
3. Use Cases
My Story: Patterson CA

Photo Credit: Wikipedia
Drafting receives computer

By Jeff Ross

"Preparing them (students) for the future", said drafting teacher Roswell Hunt is the main reason for the new drafting computer.

Hunt feels that "in the future, all drawings will be done on computers," and that if the students have experiences on such a computer it will be all the simpler for them to get a job.

Hunt also feels that the computer can help students since it is quicker and more flexible than drawing out designs on paper, since drafting with the computer eliminates time consuming steps such as darkening lines which need to be done when drafting the "old way."

The computer is an Apple C.A.D. (computer aided design) with a Bausch and Lomb light table and plotter, and Diatech software.

Although this is a very basic set-up, Hunt feels that it can do everything his classes need it for, and nearly anything the more complex systems can do.

THE DRAFTING department has just received a new Apple II. (photo by Robert Schmidt)
My Story

Orthodontic assembly with reinforcement structure
US 5707231 A

ABSTRACT

An orthodontic assembly including an orthodontic appliance and a region composed of a matrix material having a plurality of reinforcement structures distributed throughout, with some of the reinforcement structures being exposed on an exterior surface of the assembly, as well as an associated method of fabrication. In one embodiment, the entire orthodontic appliance is composed of the noted reinforcement structures and matrix material. In another embodiment, the noted region is actually a layer which is attached to a separately formed appliance, such as a bracket. Nonetheless, the reinforcement structures may be exposed in a variety of locations, such as on the base and/or arch slot. Moreover, this region may be formed by forming the appliance from the reinforcement structures and matrix material in a manner which produces skin on its exterior surface, and removing the skin from the desired areas to expose reinforcement structures partially contained within the matrix material.

Stacks, Inc.
Invented US patented processes and manufactured over 3 million ceramic dental braces
Digital Disruption
Context
Context: Labor, Energy, Water, Land
Context: By the Numbers

By 2050
9 Billion people

100% more food, and

70% will be from technology
Digital Disruption
CDFA Case Study
CDFA Workforce
Disruptive Technologies

Social  Mobile  Analytics  Sensors

Information Technology Supports the Business
UAS Use Cases

Visualisation

• Asset mapping and monitoring
• Plant health assessment, identification of problems
• Terrain mapping
• Watershed management
• Irrigation management
• Environmental assessment and reporting
• Prescribed burn planning and reporting
• Fire landscaping
UAS Use Cases
2013 UC Riverside Hyperspectral image

Photos Courtesy: NASA JPL
(Not Export Controlled Technical Data)
UAS Use Cases
Precision Agriculture

The old way of irrigating (60 acre almond orchard)

Irrigation with our water stress prototype

Farmer picks one spot (out of ~10k trees) to measure soil moisture and decides water application

Farmer gets optimized calculation of water to apply + tactical field recommendations

Courtesy: Ceres Imaging
UAS Use Cases
Make Ag Data Actionable for Farmers

01/FLY
Our intelligent and cost-effective UAVs carry groundbreaking sensors that meet the demands of large, hard-to-access sites.

02/ANALYSE
Sensors produce data and images ideal for aerial mapping and early detection of plant disease, infestations, and poor irrigation.

03/ACT
Decision-makers can optimise large-scale mapping, growing conditions and crop yield.

Courtesy: Insight Robotics
UAS Use Cases
Solving Watering Problems

Courtesy: ATV Illustrated

Courtesy: 3DR
UAS Use Cases
Thermal image

- See thermal differences in vegetation
- Identify water distribution problems

Light blue represents a clogged water nozzle

Courtesy: Cornerstone Mapping
UAS Use Cases
Digital Orthophoto Model (DOM)

- High resolution
- Geo-tagging
- Mosaic created from images captured by visible light camera

Visualise the land to identify problems quickly

Courtesy: Insight Robotics
UAS Use Cases
Digital Surface Model (DSM)

• 3D topology of land
• Includes trees and buildings

Courtesy: Insight Robotics
UAS Use Cases
Normalized Difference Vegetation Index (NDVI)

- Measures plant photosynthesis
- Highlights problems with vegetation
What Else? Disruptive Technologies

Social  Mobile  Analytics  Sensors
Social Media

Recognizing the global agriculture community is connected and engaged.
Mobile Only (and Beyond)

The enterprise potential of mobile is greater than today’s smartphone and tablet apps.

Emerging Threats

Public Weigh Scales

Plant Pest Detection

Report a Pest

Cattle Brand ID

CA Geoportal

CA Mobile Gallery
Putting the power of research in the hands of California farmers.

**BIG DATA**

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Analytics

Putting the power of research in the hands of farmers while protecting our environment.

Ecosystem Services
- Wildlife habitat
- Nutrient cycling
- Recreational, cultural activities
- Soil structure, formation, fertility
- Biodiversity conservation
- Water cycling
- Water quality
- Pollination services
Problems in AgTech

• Regulatory
• Intellectual property of Ag Land
  • Who owns the data?
  • Who controls the data?
  • How do we secure the data?
• Ag Standards
  • How do we connect billions of Ag devices to the internet?
  • What are the methods of interfacing Ag devices?
Define the Use Cases.

A farmer doesn’t want a drone; he wants an answer.
Sources and Contacts:

• Sources:
  • CDFA Website: http://www.cdfa.ca.gov
  • Planting Seeds Blog: http://plantingseedsblog.cdfa.ca.gov
    http://www.kauffman.org/newsroom/2014/04/agriculture-tech-advances-opportunities-for-entrepreneurs
  • Forbes Article: “Kauffman Report Makes The Case For AgTech Innovation & Investment”

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