

2013 40-Day Journey

Japan, Hawaii, California

- Osaka, Kyoto, and Narita, Japan
 - Wunderlich, J.T. and Wunderlich, J.J. (2013). **Green architecture and environmental design using rapid-prototyping social-networking sandbox tools, followed by professional architectural software.** *Asian Conference on Sustainability, Energy & the Environment (ACSEE 2013)*, June 6-9, Osaka, Japan. [KEY-NOTE SPEAKER] [TALK PAPER](#)
- Oahu, Hawaii
 - Wunderlich, J.T. (2013). **Green robotics, automation, and machine intelligence; a new engineering course in sustainable design.** *International Symposium on Green Manufacturing and Applications (ISGMA 2013)*, June 25-29, Oahu, Hawaii. [TALK PAPER](#)
 - University of Hawaii Architectural meetings
- Newport Beach, California

Green Architecture & Environmental Design using Rapid-Prototyping Social-Networking Sandbox Tools followed by Professional Architectural Software

2013 Asian Conference on Sustainability, Energy and the Environment, Osaka, Japan

Joseph T. Wunderlich PhD, Elizabethtown College, PA, USA
Joseph John Wunderlich





acss/acsee
spotlight speaker

Saturday Spotlight Session:

Saturday, June 8, 2013

12:30-13:15

Aoi Room 2F

xx

Joseph Wunderlich
 Elizabethtown College, USA



Dr. Joseph Thomas Wunderlich has designed two neurocomputers and part of an IBM supercomputer operating system. His Ph.D. (U.Del) and M.Eng. (Penn State) are in Electrical and Computer Engineering. He's conducted robotics research and taught a Ph.D. course at the University of Trento in Italy. He's taught 31 courses including eight new ones. He also has a BS in Architectural Engineering (U.Texas) and an almost-completed 2nd BS in Urban-Planning/Environmental-Design (UCSD). He has Project Director experience for ~\$70Million USD of architectural projects in Texas, California, and Pennsylvania; experience as a San Diego County Environmental Planner and as a San Francisco Engineering Consultant (including EPA certifications). Recently he created the Elizabethtown College Sustainable Design Engineering program and the Architectural Studies Minor.

Mr. Joseph John Wunderlich is the designer of several hundred buildings throughout many virtual worlds in Minecraft, and has presented his work on several occasions in Dr. Wunderlich's courses.

Spotlight Speech: Green Architecture and Environmental Design Using Rapid-Prototyping Social-Networking Sandbox Tools, Followed by Professional Architectural Software

In 2012 the United Nations UN-Habitat's Sustainable Urban Development Network partnered with sandbox-game developers of the social-networking block-by-block building software Minecraft to upgrade 300 public spaces worldwide by 2016 by joining professional designers with local inhabitants in virtual-world simulations. This work is similar to the authors' research since early 2011 where a Minecraft server and concurrent database server were configured for peaceful architectural development by players worldwide, and in five college engineering and architectural courses. Students build green homes, plant gardens, and raise livestock in green villages, or on a virtual college campus within environments containing simulated weather, terrains, biomes, and AI-enhanced animals. Student avatars interact to design. Social-media scrolls across the screen so everybody can be heard. Student homes have active & passive solar, thermal mass, natural daylighting, mitigation of cold northern winds, and an overall architectural esthetic. Students create gardens, livestock areas, piazza's, markets, parks, and a wellness center with indoor pool and activity rooms. Credit is given for using the software's electrical, mechanical, and logic design features. Selected students are invited to develop professional architectural drawings. LEED (Leadership in Energy and Environmental Design) concepts are incorporated throughout. Future goals included implementing these methods in new architectural studio courses and at universities abroad; helping extend the UN/Minecraft concept to developed countries; and merging this research with the author's research in robotics & machine intelligence including interactive environmental maps communicating with real-time robots. Long-term goals include on-line virtual-reality classrooms and laboratories with real-time language translation and lifelike avatars.

J. Wunderlich Ph.D. Biography



1/2 Computer Engineer



1/2 Architect and Urban Designer



Photo taken by son from other podium



Audience of approximately 200 people



Conference Banquet



AGENDA

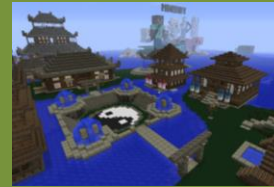
- Inspiration & modeling intro
 - United Nations



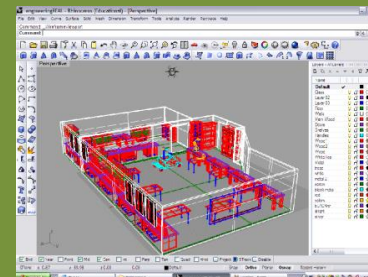
- Foam-board alternative



- Design in Social-net
 - Small-scale crowdsourcing
 - Ongoing Charette



- Professional tools
 - Flamingo, Rhinoceros, Revit



- Future

26 November 2012 Last updated at 06:28 ET

Minecraft to aid UN regeneration projects

Development plans for 300 places around the world are being modelled in Minecraft so residents can help decide how the locations will change.

Called Block by Block, the programme is part of a collaboration between Minecraft-maker Mojang and UN Habitat.

Urban locations will be recreated on computer using Minecraft allowing residents to take a virtual tour.

They will also be able to change the model and help decide how regeneration cash should be spent.



Residents will be able to take a virtual stroll around the Minecraft models

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And validation
of work since
2011

“Block by Block”

A collaboration between the United Nations and Mojang, the developers of Minecraft

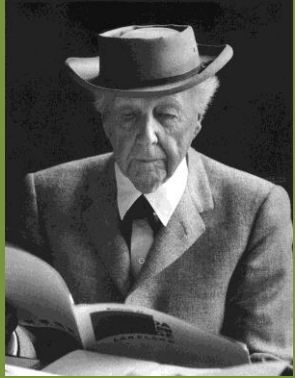


UNDUGU PLAYGROUND



Frank Lloyd Wright's Robie House

Illinois, USA



Rapid Modeling (two hours in 2011)

by Joseph John Wunderlich



Rapid Modeling (two hours in 2011)

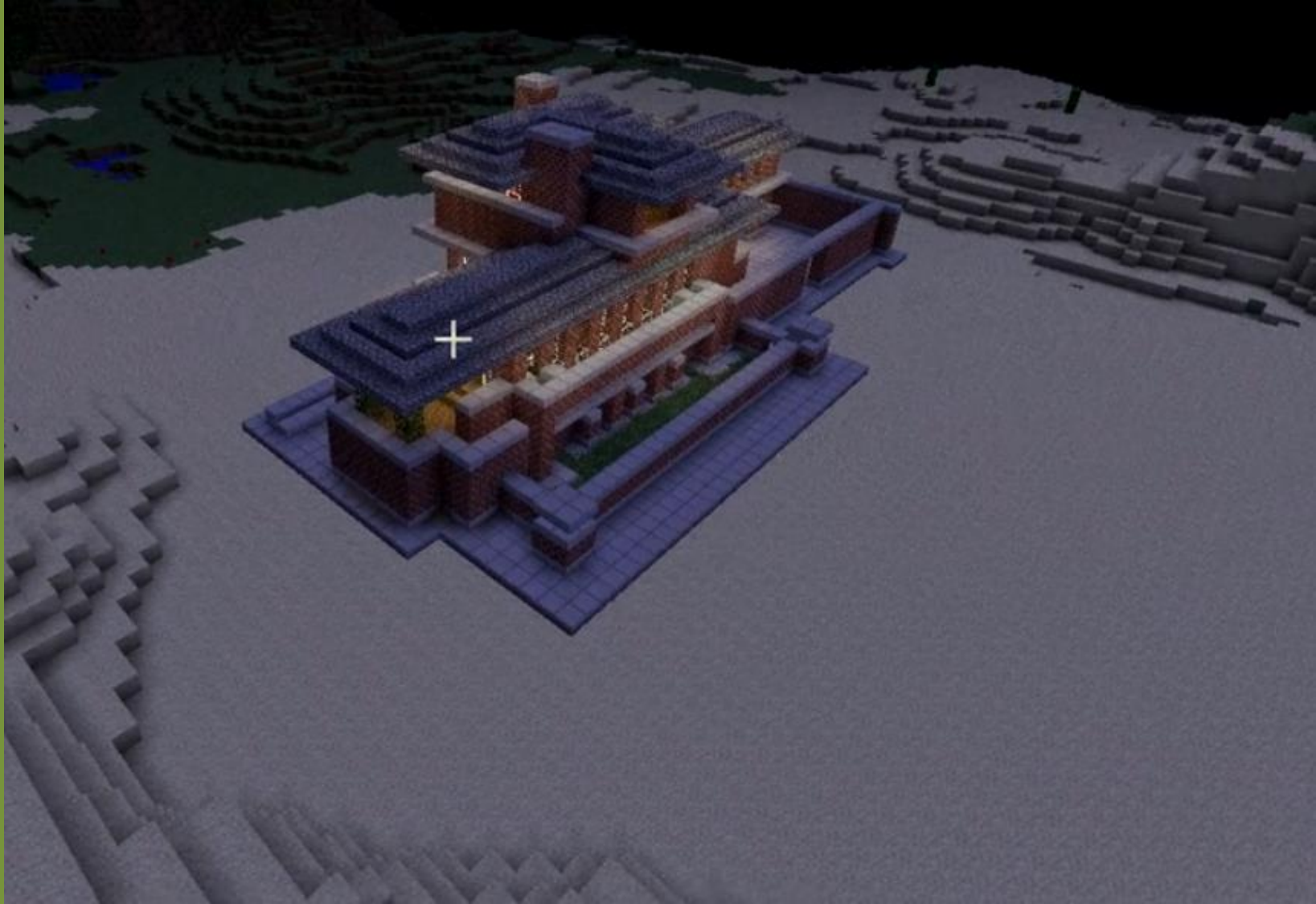
by Joseph John Wunderlich



MINECRAFT
20 Million
copies sold

Rapid Modeling (two hours in 2011)

by Joseph John Wunderlich



Rapid Modeling (two hours in 2011)

by Joseph John Wunderlich



Wunderlich Residence, 2000 Foam-board Modeling

Pennsylvania, USA



Wunderlich Residence

Foam-board Modeling



Wunderlich Residence



Foam-board Modeling

by J. Wunderlich, PhD



Wunderlich Residence



Foam-board Modeling (several weeks in 2000)

by J. Wunderlich, PhD



Wunderlich Residence



Built House (early 2000's)

by J. Wunderlich, PhD
and Joseph John Wunderlich



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Rapid Modeling

(facade in one hour in 2013)

by Joseph John Wunderlich



Wunderlich Residence

Rapid Modeling

(facade in one hour in 2013)

by Joseph John Wunderlich



Wunderlich Residence

Rapid Modeling

by Joseph John Wunderlich



Wunderlich Residence

Rapid Modeling

by Joseph John Wunderlich



Wunderlich Residence

Rapid Modeling

by Joseph John Wunderlich



Wunderlich Residence

Rapid Modeling

by Joseph John Wunderlich



Wunderlich Barn in 2013 may become a College lab



Yes ? No

11		Sustainable Sites	26 Points	
Y		Prereq 1 Construction Activity Pollution Prevention	Required	
1		Credit 1 Site Selection	1	UNOBSTRUCTED SOUTHERN EXPOSURE, SHIELDED NORTHRN, A+ VIEWS
5		Credit 2 Development Density & Community Connectivity	5	COMPLIMENTS/PRESERVES FARM COMMUNITY ESTHETIC AND CULTURE
	N	Credit 3 Brownfield Redevelopment	1	not applicable, BUT RESTORATION OF 150-YEAR OLD STRUCTURES
	N	Credit 4. Alternative Transportation, Public Transportation Access	6	not applicable IN FARMING COMMUNITY
1		Credit 4. Alternative Transportation, Bicycle Storage & Changing Rooms	1	BIKES FOR EVERY FAMILY MEMBER
	N	Credit 4. Alternative Transportation, Low-Emitting and Fuel-Efficient Vehicle	3	NOT YET -- PLANNING HYBRID VEHICLE PURCHASE
	N	Credit 4. Alternative Transportation, Parking Capacity	2	not applicable IN FARMING COMMUNITY
1		Credit 5. Site Development, Protect or Restore Habitat	1	212 TREES PLANTED, FENCED-IN WILDLIFE, BIRD SANCTUARY CREATED
1		Credit 5. Site Development, Maximize Open Space	1	EXTENSIVE -- 3-1/2 Acres
	N	Credit 6. Stormwater Design, Quantity Control	1	FRENCH DRAINS AROUND NEW CONSTRUCTION
	N	Credit 6. Stormwater Design, Quality Control	1	GREY-WATER SYSTEM BEING CONSIDERED
	N	Credit 7. Heat Island Effect, Non-Roof	1	not applicable IN FARMING COMMUNITY
	N	Credit 7. Heat Island Effect, Roof	1	not applicable IN FARMING COMMUNITY
1		Credit 8 Light Pollution Reduction	1	RECYCLE ALL PLASTIC AND PAPER, DONATE CLOTHES, ETC. TO POOR

3		Water Efficiency	10 Points	Notes
Y		Prereq 1 Water Use Reduction, 20% Reduction	Required	
1		Credit 1 Water Efficient Landscaping	2 to 4	MINIMAL IRRIGATION FOR TREES AND 3 TO 4 GARDENS PER YEAR
1		Credit 2 Innovative Wastewater Technologies	2	NEW DRAINFIELD
1		Credit 3 Water Use Reduction	2 to 4	LOW-PRESSURE WELL; DISHES: HAND-WASH + ENERGY-EFF DISHWSHR

7		Energy & Atmosphere	35 Points	Notes
Y		Prereq 1 Fundamental Commissioning of the Building Energy Systems	Required	
Y		Prereq 2 Minimum Energy Performance	Required	
Y		Prereq 3 Fundamental Refrigerant Management	Required	
6		Credit 1 Optimize Energy Performance	1 to 19	OIL + ELECTRIC ZONES WITH ARTIFICIAL INTELLIGENCE COMING
1		Credit 2 On-Site Renewable Energy	1 to 7	ACTIVE SOLAR, GROUND WATER LOOP, & WIND BEING CONSIDERED
	N	Credit 3 Enhanced Commissioning	2	not yet
	N	Credit 4 Enhanced Refrigerant Management	2	not yet
	N	Credit 5 Measurement & Verification	3	not yet
	N	Credit 6 Green Power	2	not yet

11		Materials & Resources		Notes
Y		Prereq 1 Storage & Collection of Recyclables	Required	
3		Credit 1. Building Reuse, Maintain Existing Walls, Floors & Roof	1 to 3	EXTENSIVE -- PRESERVATION OF 95% OF EXISTING STRUCTURES
1		Credit 1. Building Reuse, Maintain 50% of Interior Non-Structural Elements	1	EXTENSIVE - 90% MAINTAINED
2		Credit 2 Construction Waste Management	1 to 2	EXTENSIVE -- PRECISE MATERIAL ESTIMATES, NO DUMPSTERS
2		Credit 3 Materials Reuse	1 to 2	EXTENSIVE -- ALL POST & BEAMS, AND SIDING, AND STONES
?		Credit 4 Recycled Content	1 to 2	SOME, BUT UNCERTAIN PERCENTAGE
2		Credit 5 Regional Materials	1 to 2	85% LOCAL BUILDING SUPPLIER w/in 10 miles, REUSE OF WOOD & STONE
1		Credit 6 Rapidly Renewable Materials	1	90% WOOD CONSTRUCTION
?		Credit 7 Certified Wood	1	POSSIBLY SOME -- NEED TO CHECK RECORDS

LEED
Analysis
(academic)
in 2013 for
College course
"Green
Architectural
Engineering"



Page

11			Indoor Environmental Quality	15 Points	Notes
Y			Prereq 1 Minimum IAQ Performance	Required	
Y			Prereq 2 Environmental Tobacco Smoke (ETS) Control	Required	
		N	Credit 1 Outdoor Air Delivery Monitoring	1	
1			Credit 2 Increased Ventilation	1	ATTIC TEMP-CONTROLLED FANS, PLENUMS FOR OPTIMAL AIR-FLOW
1			Credit 3.1 Construction IAQ Management Plan, During Construction	1	MASKS, NEGVE-PRESS CONTAINMENT, AND VENTILATION/FANS ALWAYS
1			Credit 3.2 Construction IAQ Management Plan, Before Occupancy	1	CONTAINMENT AND VENTILATION
1			Credit 4.1 Low-Emitting Materials, Adhesives & Sealants	1	WATER-BASED WHEN POSSIBLE
1			Credit 4.2 Low-Emitting Materials, Paints & Coatings	1	LOW-VOC'S (Volatile Organic Compounds), PAINTS WATER-BASED
1			Credit 4.3 Low-Emitting Materials, Flooring Systems	1	ALL-WOOD, MINIMAL VOC'S
		?	Credit 4.4 Low-Emitting Materials, Composite Wood & Agrifiber Products	1	ALWAYS ATTEMPTED MINIMAL VOC'S -- NEED TO CHECK RECORDS
1			Credit 5 Indoor Chemical & Pollutant Source Control	1	RADON TESTED, CO2 MONITORED, INCREASED VENTILATION
		N	Credit 6.1 Controllability of Systems, Lighting	1	NOT YET, BUT DAILY FAMILY LIGHTING-MINIMIZATION PLAN
1			Credit 6.2 Controllability of Systems, Thermal Comfort	1	SEVERAL PROGRAMMED ZONES (ARTIFICIAL INTELLIGENCE PLANNED)
1			Credit 7.1 Thermal Comfort, Design	1	PROGRAMMED ZONES, DEHUMIDIFICATION
		N	Credit 7.2 Thermal Comfort, Verification	1	NOT YET
1			Credit 8.1 Daylight & Views, Daylight 75% of Spaces	1	EXTENSIVELY OPTIMIZED
1			Credit 8.2 Daylight & Views, Views for 90% of Spaces	1	EXTENSIVELY OPTIMIZED
5			Innovation & Design Process	6 Points	Notes
1			Credit 1.1 Innovation in Design: Provide Specific Title	1	EXTRA INSULATION, Vapor & Moisture BARRIERS; Northern BUFFER SPACES
1			Credit 1.2 Innovation in Design: Provide Specific Title	1	OVERALL BUILDING HAS LOW SURFACE-AREA TO VOLUME RATIO
1			Credit 1.3 Innovation in Design: Provide Specific Title	1	STRUCTURAL REINFORCING OF OLD HOUSE WITH NEW FOUNDATIONS
1			Credit 1.4 Innovation in Design: Provide Specific Title	1	99% CONSTRUC BY OWNER W/ HAND-TOOLS, 70 YARDS DIRT W/SHOVEL
1			Credit 1.5 Innovation in Design: Provide Specific Title	1	212 NEW TREES: PASSIVE-SOLAR, WINDBLOCK, NOISE-CONTROL , BIRDS
		N	Credit 2 LEED® Accredited Professional	1	OWNER PREPARING TO TAKE LEED GA EXAM
2			Regional Priority	4 Points	Notes
1			Credit 1.1 Regional Priority: Provide Specific Title	1	PRESERVING EXISTING FARMHOUSES AND BARNs
1			Credit 1.2 Regional Priority: Provide Specific Title	1	3 TO 4 WORKING GARDENS PER YEAR -- AGRICULTURAL ZONING
			Credit 1.3 Regional Priority: Provide Specific Title	1	
			Credit 1.4 Regional Priority: Provide Specific Title	1	
50			Project Totals (pre-certification estimates)	110 Points	ADD 15 POINTS WHEN SOLAR, WIND, & AI ZONES DONE
Yes	?	No	Certified 40-49 points Silver 50-59 points Gold 60-79 points Platinum 80-110 points		

LEED
Analysis
(academic)
in 2013 for
College course
"Green
Architectural
Engineering"



Wunderlich Barn in 2013 may become a College lab

“WUNDERResin EAST”



Josephs Kingdom

(built off-line)

Rapid Prototyping of Cities

(30+ buildings in a few weeks in 2011)

by Joseph John Wunderlich

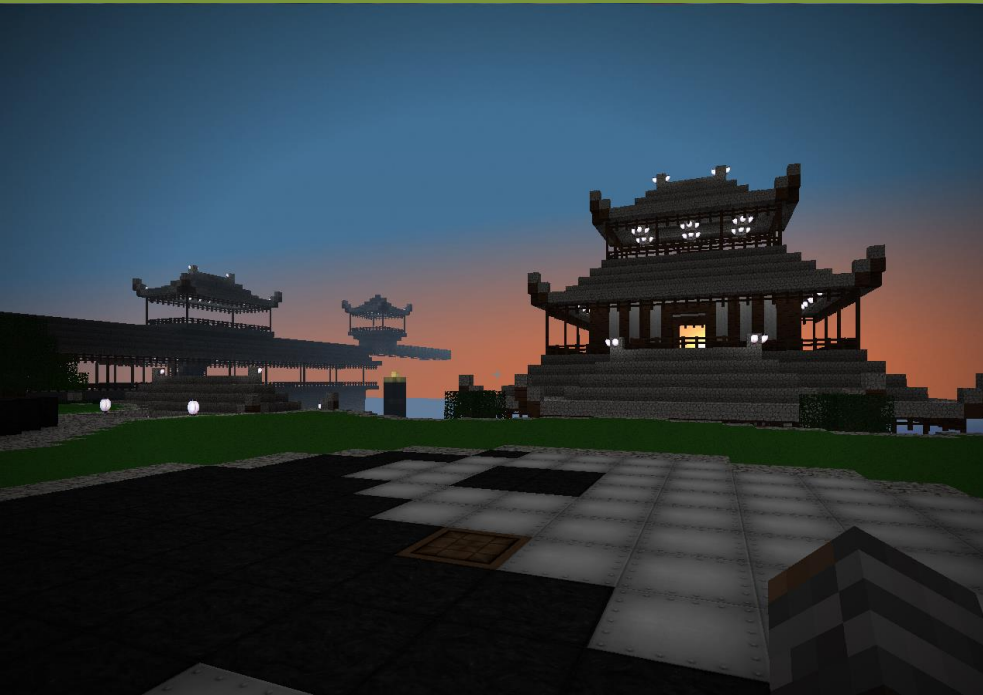


Josephs Kingdom
(built off-line)

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Josephs Kingdom
(built off-line)

Rapid Prototyping of Cities

(30+ buildings in a few weeks in 2011)

by Joseph John Wunderlich



Working Railways



Josephs Kingdom
(built off-line)

Rapid Prototyping of Cities (30+ buildings in a few weeks in 2011)

by Joseph John Wunderlich



Building on public servers

Unfortunately much destruction
on many public servers

Design in Social-net

(much built in 2011)

by Joseph John Wunderlich



Building on public servers

Design in Social-net

To avoid being “Griefed,”
build forts in remote locations

(much built in 2011)

by Joseph John Wunderlich



Design in Social-net

(much built in 2011)

by Joseph John Wunderlich

Building on public servers

Or join a “Faction Server,”
build a fortress,
then build an army

```
Is_Nerd joined the game.  
<Tsojin [Member] skyejacob> joe theirs a enderman on the wa  
ll  
<Tsojin [Member] Joejin> i know  
<Tsojin [Member] Joejin> im gonna get him with an arrow  
<Tsojin [Member] cameronwight> Shh this i my secret bit@D  
<Tsojin [Member] cameronwight> Ok  
ariellerules26 joined the game.  
<Tsojin [Member] cameronwight> Thats the tour  
<Tsojin [Member] Joejin> k  
<Tsojin [Member] cameronwight> Say bye joe  
<Tsojin [Member] Joejin> byebye  
<Tsojin [Member] Joejin> take it easy guys
```



Wunderlich Tsojin Server

Design in Social-net

(in 2011)

by Joseph John Wunderlich
and J. Wunderlich PhD

BETTER SOLUTION:
Create our own
“Creative Server” !



Wunderlich Tsojin Server

Design in Social-net

(in 2011)



All initial-world architecture, and player ranking system by Joseph John Wunderlich
Two good friends from public servers helped found Tsojin:
Eve (Canada) and **Cameron** (England)



Server configuration, hosting, maintenance, and some moderating by J. Wunderlich PhD



(in 2011)



Concurrent database server implemented to allow rollback of "Griefing"

Also implemented foul - language censorship, and disabled features such as fire-spread, placing lava, and TNT



(in 2011)



For a more powerful server, a “BUKKIT” server mod “CRAFTBUKKIT” used to allow:

1. PLAYER RANKING; Ours are: *Guest, Builder, Architect, Master, Admin, and Grandmaster* -- each having many accumulated commands. Bukkit plug-ins “ESSENTIALS,” “PERMISSIONS,” “CHAT,” and “GROUPMANAGER” were configured.
2. SQL DATABASE SERVER and plug-in “LOGBLOCK” for logging player activity to allow rolling-back of “griefing” (destruction or construction by un-invited or misbehaving players). The initial release of Tsojin Server was public. Unfortunately, due to griefing (including organized griefing teams), Tsojin was made private.
3. MULTI-WORLD plug-in to allow concurrent worlds (and teleportation & gateways between). Tsojin has six worlds.
4. Many other plug-ins (foul-language censorship, establishing monetary systems, allowing aircraft and vehicles to move, locking tool chests, sign-posting, etc.).

Tsojin and **Sturz** Servers in five College courses:

EGR280 Engineering Research

PH275 Cognitive Science

FYS100 First Year Seminar: Scientific Modeling for Sport

EGR332 Computer Organization & Architecture

EGR343 Green Architectural Engineering course

Modeling in Social-net

(in 2012)

***“Sturz” Server created by
Wunderlich student Ricky Sturz***



Built in only two hours
by 16 students !

(only the footprint was created in advance)

EGR280 Engineering Research

FYS100 First Year Seminar: Scientific Modeling for Sport

Modeling in Social-net

2012 Hackman Apartments Team-build



Built in only two hours
by 16 students !

(footprint created in advance)

Modeling in Social-net

2012 Hackman Apartments Team-build

Four Team
Leaders set
standards
(and toured actual
buildings before
team-build)

These chosen four
developed skills on
Tsojin during the
summer before
their Freshman year



Built in only two hours
by 16 students !

(footprint created in advance)

Modeling in Social-net

2012 Hackman Apartments Team-build

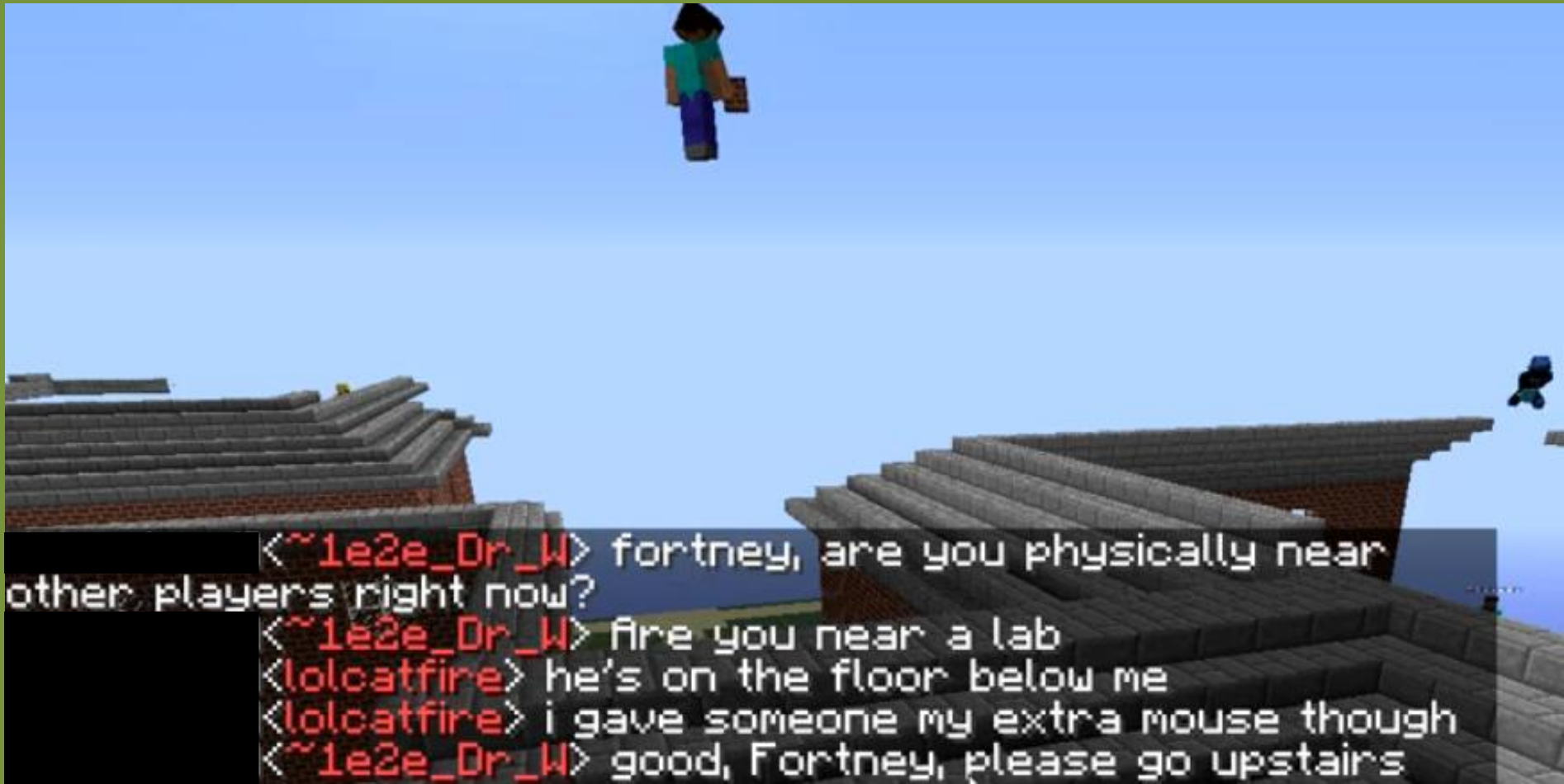


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(footprint created in advance)

Modeling in Social-net

2012 Hackman Apartments Team-build



<~1e2e_Dr_W> fortney, are you physically near other players right now?

<~1e2e_Dr_W> are you near a lab

<lolcatfire> he's on the floor below me

<lolcatfire> i gave someone my extra mouse though

<~1e2e_Dr_W> good, Fortney, please go upstairs

Built in only two hours
by 16 students !

(footprint created in advance)

Modeling in Social-net

2012 Hackman Apartments Team-build



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Modeling in Social-net

2012 Hackman Apartments Team-build



Built in only two hours
by 16 students !

(footprint created in advance)

Modeling in Social-net

2012 Hackman Apartments Team-build



Peer
Mentoring



Built in three hours by 40
students (~50% of interior complete)
(footprint and section of facade created in advance)

EGR280 Engineering Research

PH275 Cognitive Science

FYS100 First Year Seminar: Scientific Modeling for Sport

EGR332 Computer Organization & Architecture

EGR343 Green Architectural Engineering course

Modeling in Social-net

2012 Masters Center Team-build

10 Team

Leaders set
standards

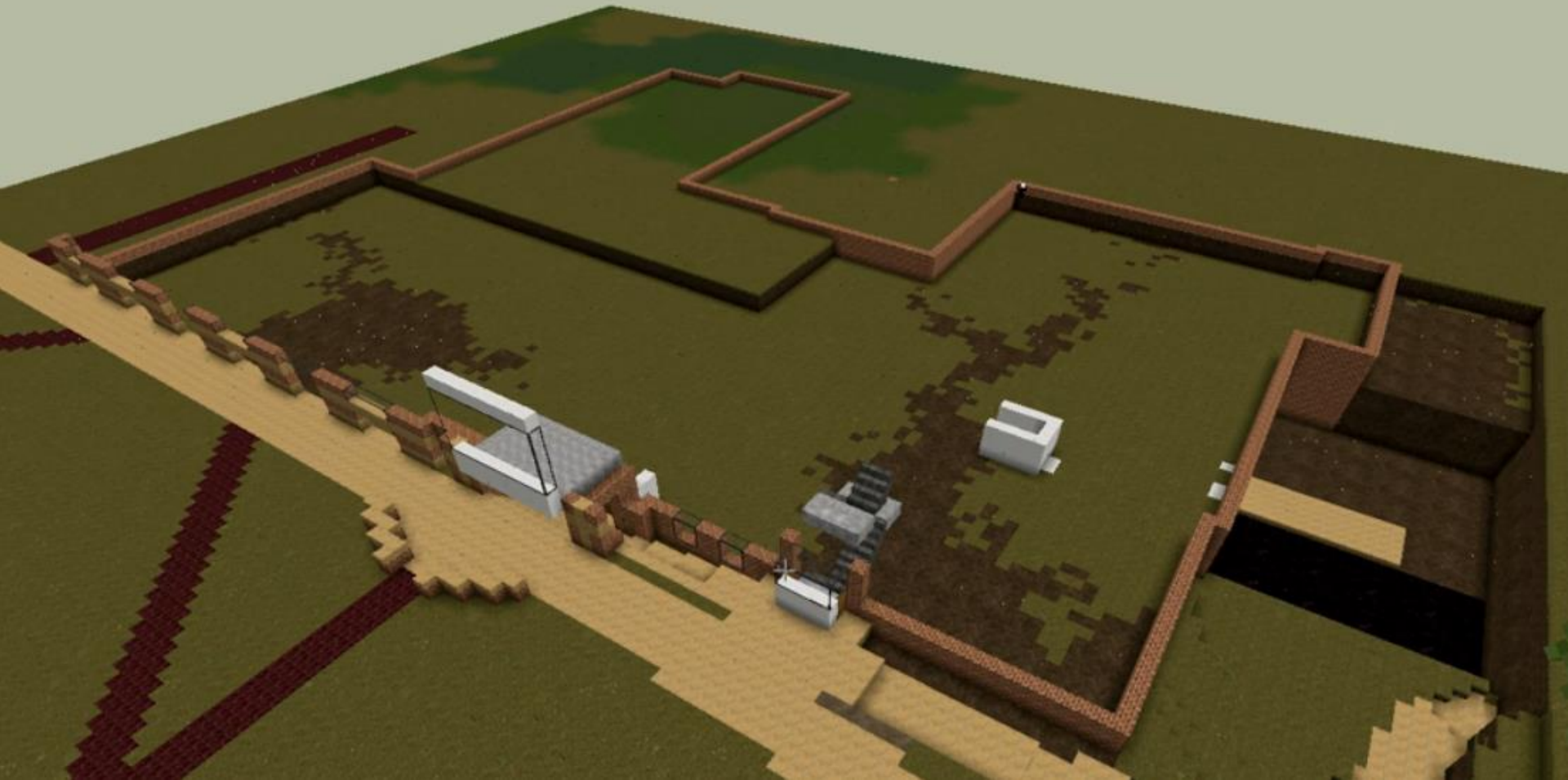
(and toured actual
building before
team-build)



Modeling in Social-net

Footprint and part of façade
by Ricky Sturz as part of
EGR280 Engineering Research

2012 Masters Center Team-build



Built in three hours by 40
students (~50% of interior complete)
(footprint and section of facade created in advance)

Modeling in Social-net

2012 Masters Center Team-build



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(only footprint and section of facade created in advance)

Modeling in Social-net

2012 Masters Center Team-build



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Modeling in Social-net

2012 Masters Center Team-build



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(only footprint and section of facade created in advance)

Modeling in Social-net

2012 Masters Center Team-build



Six Tsojin Worlds

- Main World
- Survival World
- Digital Design World
- FYSworld (four GREEN towns)
- Two private worlds

Design in Social-net



(in 2012)

by Joseph John Wunderlich
and J. Wunderlich PhD



Six Tsojin Worlds

- Main World
-
-
-
-
-

All players initially enter
in town-center
in Main World

Design in Social-net



(in 2012)

by Joseph John Wunderlich
and J. Wunderlich PhD



Six Tsojin Worlds

- Main World
-
-
-
-

They're then directed to bulletin board building and various portals to other Tsojin worlds

Design in Social-net

(in 2012)

by Joseph John Wunderlich
and J. Wunderlich PhD



Six Tsojin Worlds

- Main World
-
-
-
-

Design in Social-net

(in 2012)

by Joseph John Wunderlich
and J. Wunderlich PhD



Bulletin board building



Six Tsojin Worlds

Design in Social-net

(in 2012)

by Joseph John Wunderlich
and J. Wunderlich PhD



- Main World
-
-
-
-
-

Bulletin
board



Six Tsojin Worlds

- Main World
-
-
-
-
-

Portals to other Tsojin worlds



Design in Social-net



(in 2012)

by Joseph John Wunderlich
and J. Wunderlich PhD



Six Tsojin Worlds

Design in Social-net

(in 2012)

by Joseph John Wunderlich
and J. Wunderlich PhD



- Survival World

Default Minecraft mode is “survival” in this world, so all food & materials must be hunted or gathered (including mining); and tools and other materials are crafted

Initial hunting and gathering is with no tools

Animal behavior driven by Artificial Intelligence

- Flocking, herding
- Predators and prey
- They reproduce
- They can be tamed

Name	Input » Output	Name	Input » Output	Name	Input » Output
Workbench		Ore Blocks		Clay Block	
Furnace		Cloth Block		Brick Block	
Planks		TNT Block		Axes	
Sticks		Steps		Pickaxes	
Torches		Stairs		Shovels	
Chest		Snow Block		Swords	

Six Tsojin Worlds

-
-
- Digital Design World
-
-

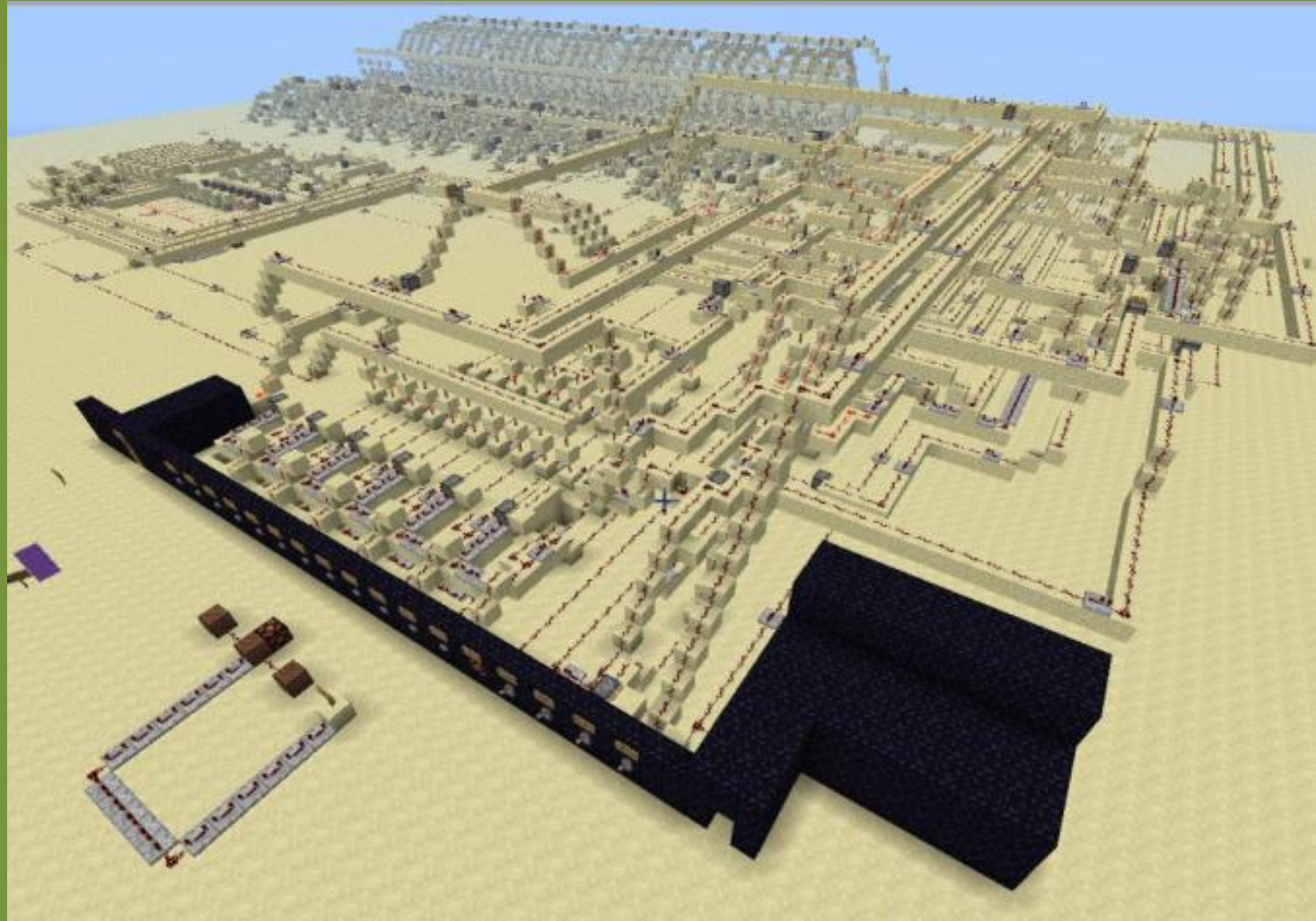
Design in Social-net

(in 2012)



Combination lock
by student Tom
Gorko in EGR332
Computer
Organization &
Architecture

(using built-in
Minecraft circuit-
design and logic
gates)



Six Tsojin Worlds

-
-
-
- **FYSworld (Four GREEN towns)**
-

Design in Social-net

(in 2012)

by Joseph John Wunderlich
and J. Wunderlich PhD



This world
dedicated
to 16
students in
the First
Year
Seminar
(FYS) course
“Scientific
Modeling
for Sport”



Six Tsojin Worlds

-
-
- FYSworld
-

Four
GREEN
towns

Design in Social-net

(in 2012)
by 16 College Freshmen



Six Tsojin Worlds

-
-
-
- FYSworld
-

GREEN town
Goodville



(in 2012)
by 4 College Freshmen

Library and
rapid-transit
system

Community
garden center
and livestock
pasture



Six Tsojin Worlds

-
-
- FYSworld
-

GREEN town
Sheckardville



Community
garden

Design in Social-net

(in 2012)

by 4 College Freshmen

Very
walkable
town



Six Tsojin Worlds

-
-
-
- FYSworld
-

GREEN town
Williamsville



Community
farm

Design in Social-net

(in 2012)

by 4 College Freshmen

Community
garden in
bio-dome



Six Tsojin Worlds

-
-
- FYSworld
-

GREEN town
Davallaville



Design in Social-net

(in 2012)

by 4 College Freshmen

Community
garden and
livestock

Hydroelectric
power



Six Tsojin Worlds

-
-
- FYSworld
-

All sixteen homes in GREEN towns required to have many sustainable features



Design in Social-net

(in 2012)

by 16 College Freshmen

Maximum natural daylighting



Six Tsojin Worlds

-
-
-
- FYSworld
-

All sixteen homes in GREEN towns required to have many sustainable features



Creative use of thermal mass

Design in Social-net

(in 2012)

by 16 College Freshmen



Active and passive solar

Six Tsojin Worlds

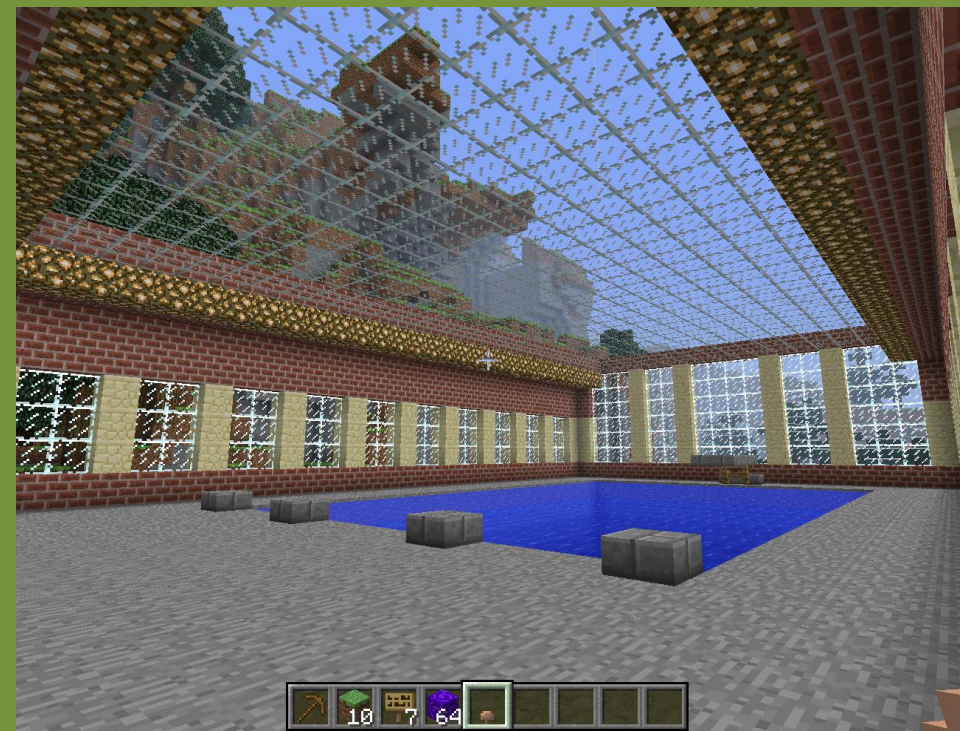
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- FYSworld
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Design in Social-net

(in 2012)

by 16 College Freshmen

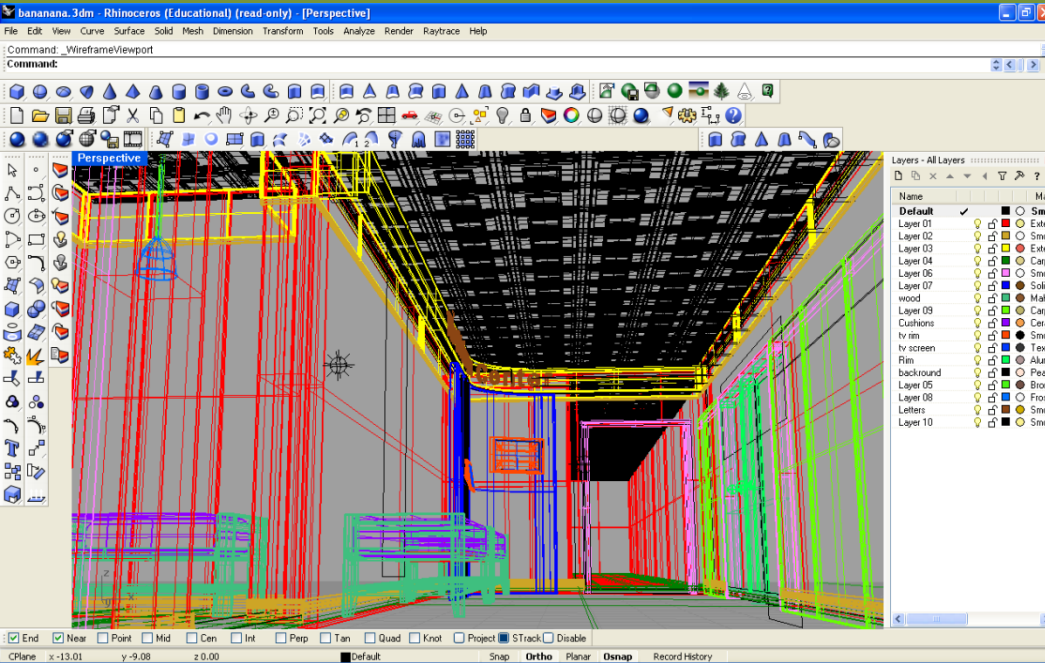
Each GREEN town needed a dedicated lot for 24 visiting high school students to build a Wellness Center with Activity Room, lockers, and an indoor pool – all in one hour !



Rendering Software

by Bryan Kuppe 2006
EGR280 Engineering Research

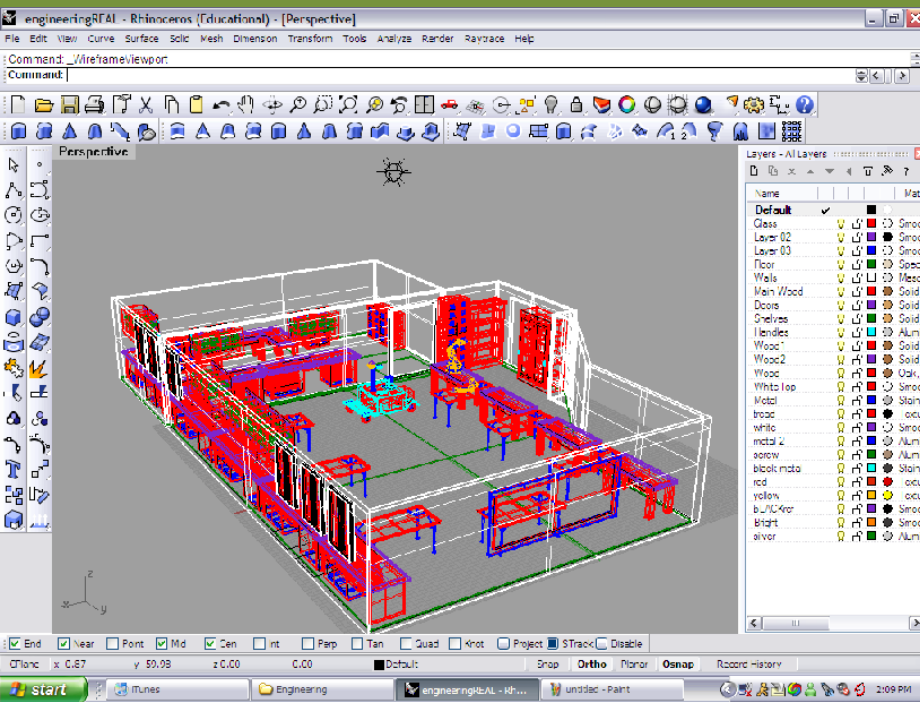
“Rhinoceros” and “Flamingo”
software for Elizabethtown
College Steinman Building
Lobby Renovations



Rendering Software

by Bryan Kuppe 2008
EGR280 Engineering Research

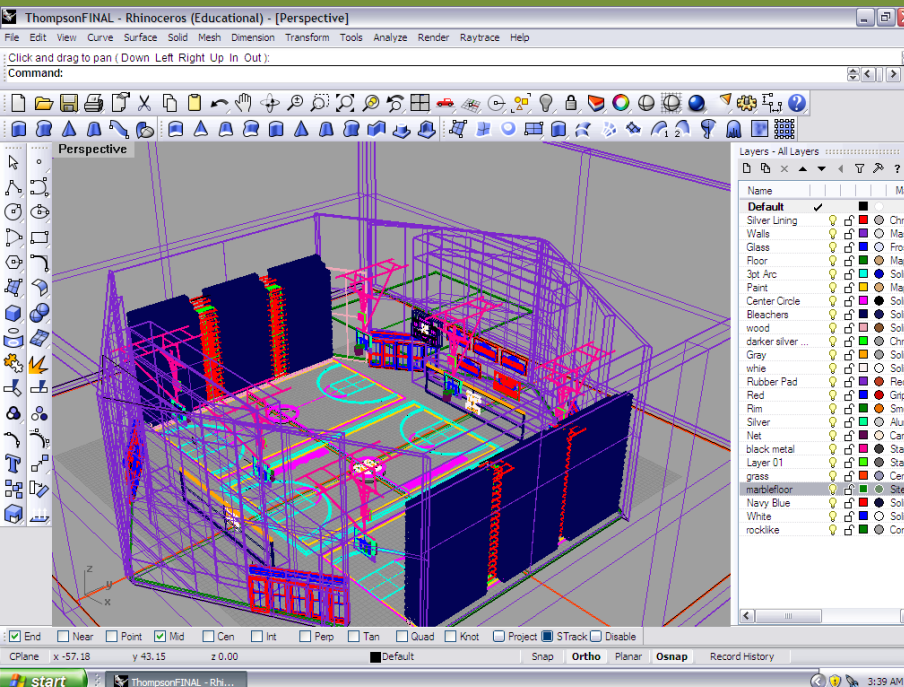
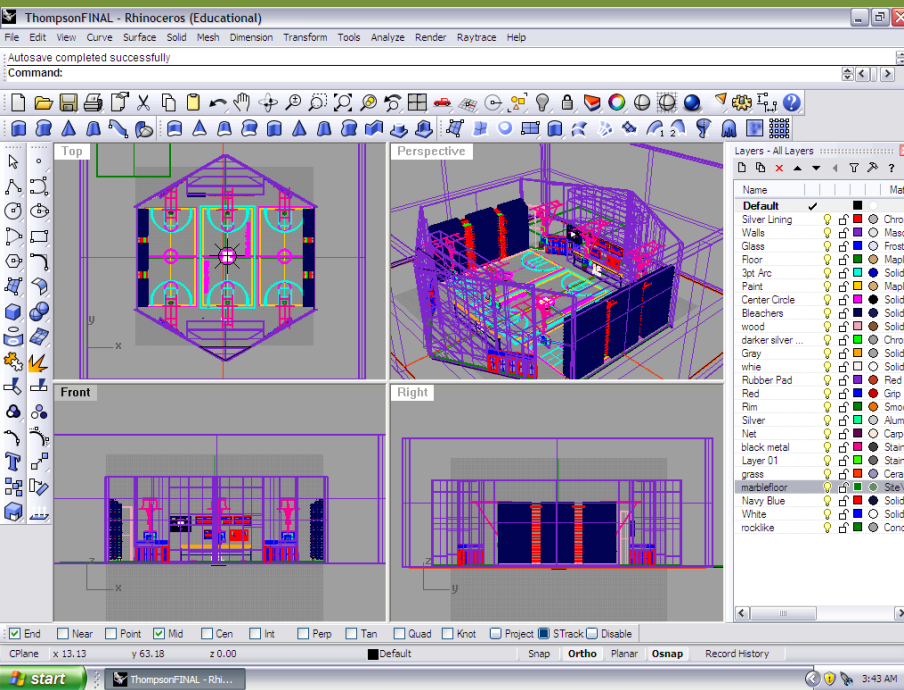
“Rhinceros” and “Flamingo”
software for Elizabethtown
College Wunderlich
Robotics & Machine
Intelligence Lab

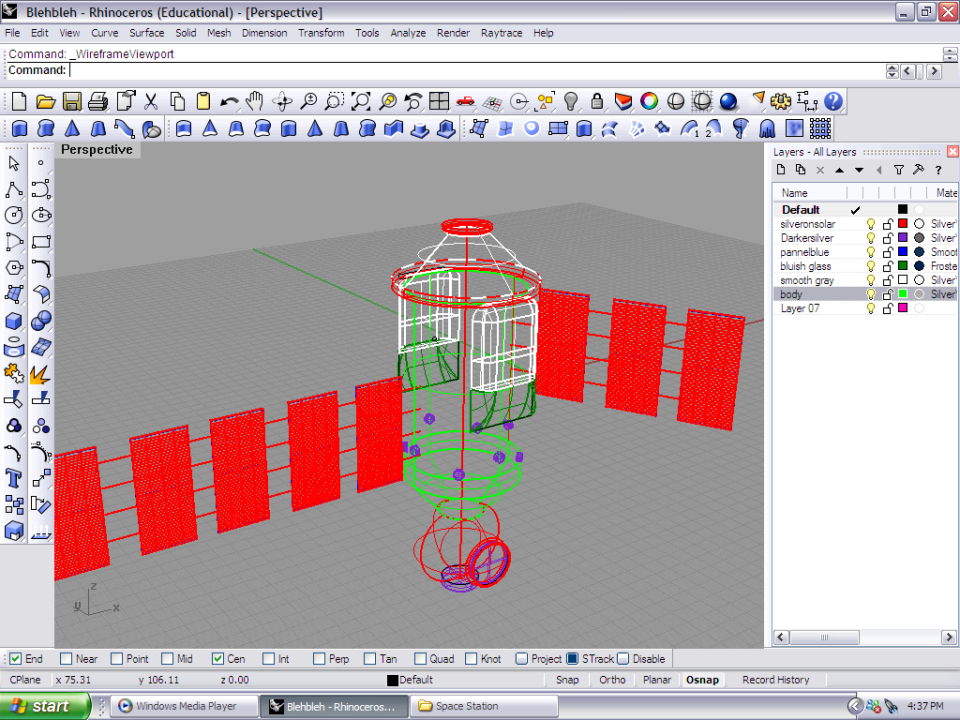


Rendering Software

by Bryan Kuppe 2008
EGR280 Engineering Research

“Rhinceros” and “Flamingo”
software for Elizabethtown
College Gym Renovations

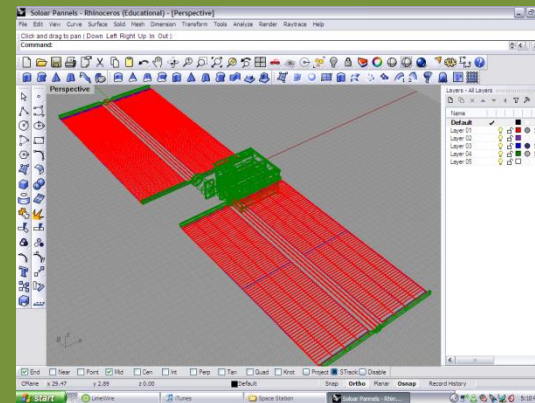




Rendering Software

by Bryan Kuppe 2010
EGR280 Engineering Research

“Rhinoceros” and “Flamingo”
software for NASA
Space Station



“Revit”

software for LEED
redevelopment

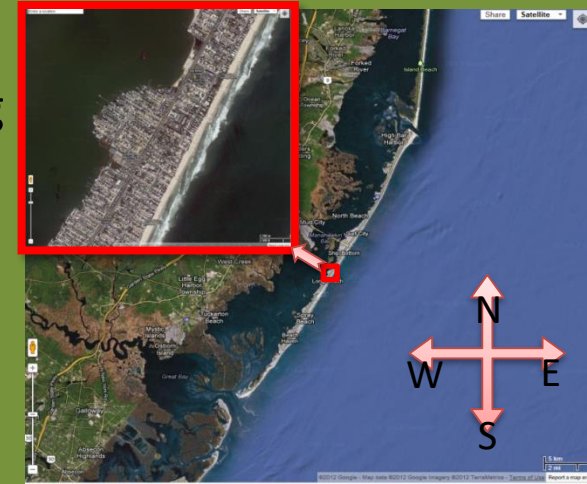
of family’s New Jersey

vacation property destroyed
in 2012 by hurricane Sandy

Professional Software with Data-Base of detailed specifications tied to all graphics elements (i.e., “BIM” – Building Information Modeling)

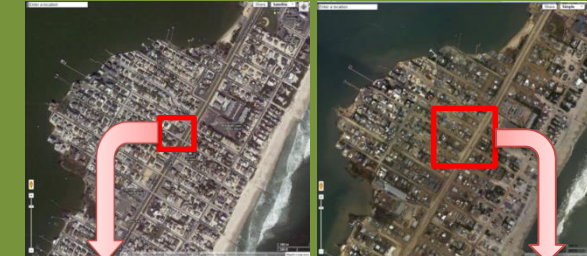
by Emily Vogel 2012

EGR343 Green Architectural Engineering



Before Hurricane Sandy August 2009

After Hurricane Sandy November 1, 2012



Site Selection

7506 S. Long Beach Boulevard
Beach Haven Crest, NJ 08008
39 6008' N, 74 2111' W
Zillow Estimate: \$570,258

- Rental property, fully used in summer, rarely used in winter
- Located in a storm surge area with elevation 7'
- Destroyed by Hurricane Sandy in 2012

Site Features

- 0.15 miles from the ocean & 0.3 miles from bay
- Public utilities
- Low crime, high recreation area
- Corner property with neighboring properties to East and North that prevent wind
- Provides views of ocean and bay

Goals

- Minimize noise from main island boulevard
- Maximize private area & views
- Avoid future flooding
- Cater to weather from May through September

Solutions

- 6' tall fence and trees along northwest, northeast, and southeast side to minimize noise from boulevard
- Fence also gives private outdoor backyard area
- Large living room windows facing backyard to join outdoor and indoor living space
- First floor is 3' off the ground to prevent future flooding
- FEMA will be providing money to those who rebuild at heights of 3' or higher

Potential LEED Credits

Location & Linkages

- Located on previously developed lot
- Other properties surrounding two sides
- Within walking/biking distance from community resources
- Located near existing water/sewage systems
- Roof top deck & backyard patio encourage outdoor use

Sustainable Sites

- Existing arborvitae along Northeast boundary to block wind
- Trees & shrubbery in front of property
- Permeable patio for management of storm water
- Light colored patio and decks to minimize heat island effects
- Located on 1/10 of an acre

Water Efficiency

- Uses high efficiency bathroom fixtures
- Uses high efficiency washing machine

Energy & Atmosphere

- Photovoltaic grid tied system
- Pergolas for outdoor shade
- Portico over front door for shade
- Wide white venetian blinds to reflect sun
- Window awnings to provide shade
- Retractable awning on sunroom porch
- Sunroom for winter with thermal drapes above doors
- Thermal drapes in NE facing windows
- EnergyStar appliances

Materials & Resources

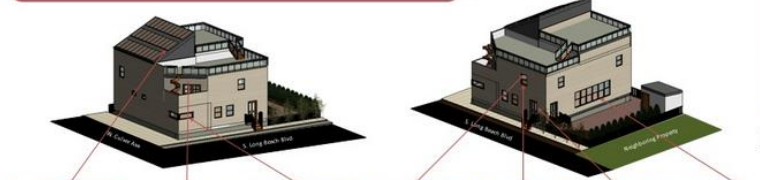
- Use Low VOC adhesives, sealants, paints, coatings, etc.

Indoor Environmental Quality

- Mudroom to minimize debris in house
- Solar fan for attic ventilation

Innovation

- Bike rack attached to shed
- Rooftop decks provide views of ocean and bay
- Textured glass bathroom windows for light privacy
- Deep kitchen windowsills for growing herbs & flowers



Proposed Design to Replace a New Jersey Vacation Home Destroyed by Hurricane Sandy

Emily Vogel
EGR 343: Green Architectural Engineering

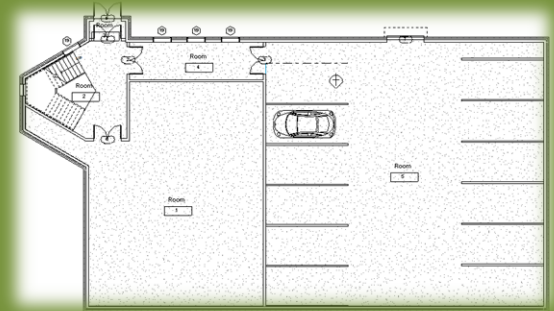
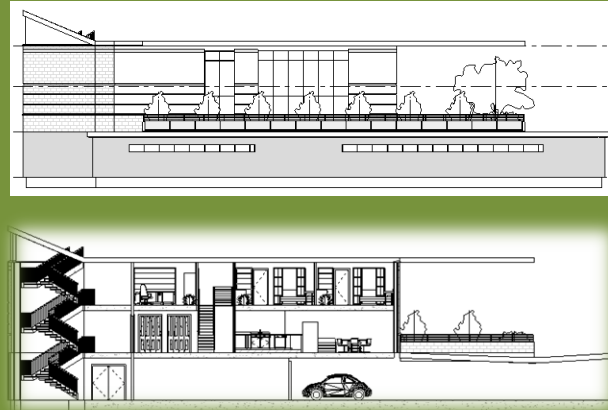
“Revit”

software for LEED
redevelopment

In Philadelphia, PA, USA

Professional Software with Data-Base of detailed
specifications tied to all graphics elements
(i.e., “BIM” – Building Information Modeling)

by Vaclav Hasik 2012
EGR343 Green Architectural
Engineering



“Revit”

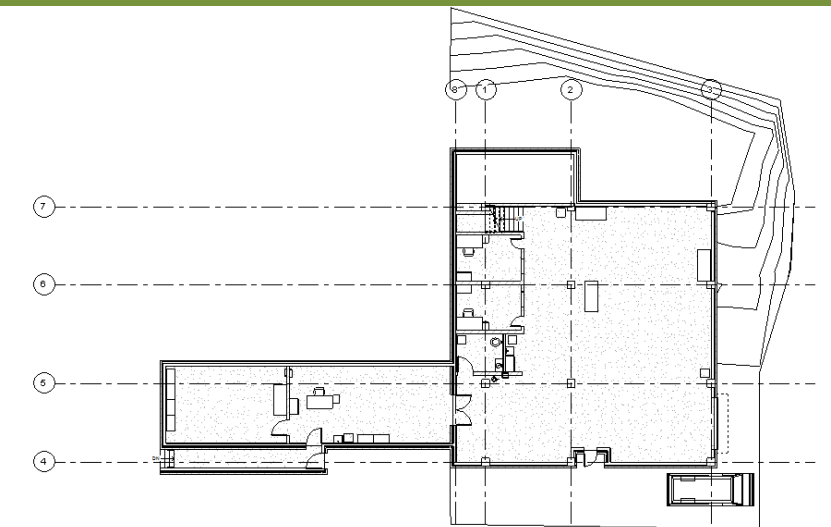
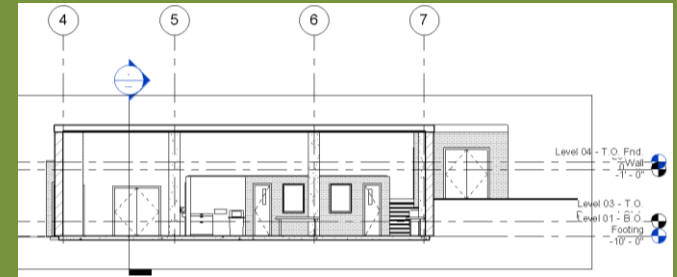
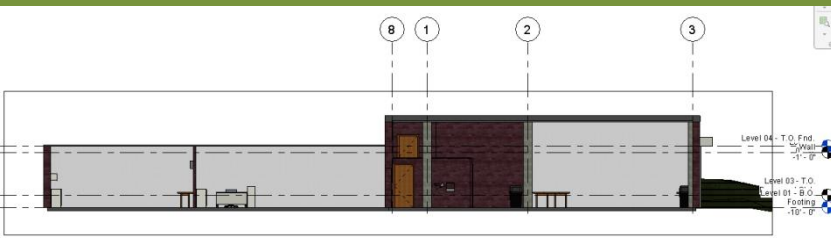
software for new

Engineering & Physics Dept.

Shop Extension

Professional Software with Data-Base of detailed specifications tied to all graphics elements (i.e., “BIM” – Building Information Modeling)

by Kaylee Werner
EGR280 Engineering Research

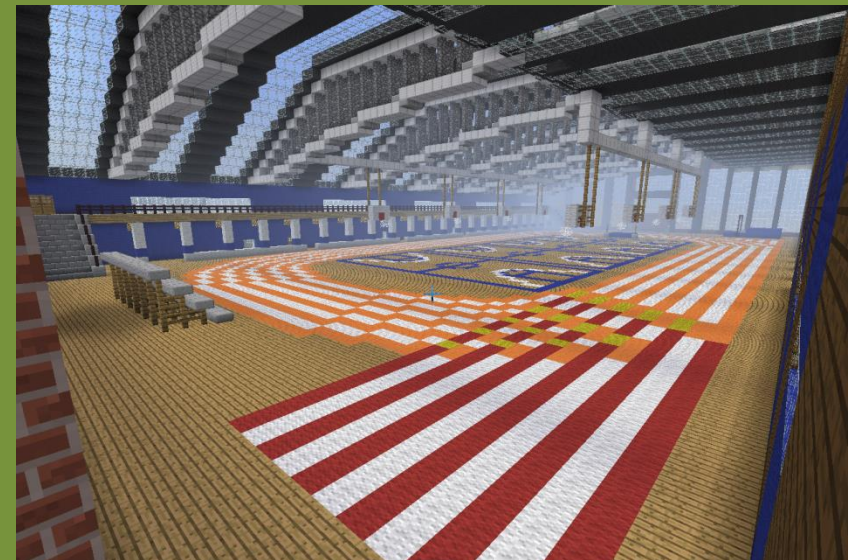
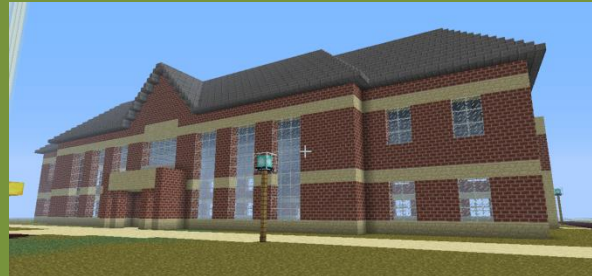


Minecraft

VIDEO

by Ricky Sturz 2013/14
EGR280 Engineering Research

Modeled entire campus in only one semester using Minecraft, including his proposed Field-House/Wellness-Center that he's now using Revit software on



Collaborative Opportunities

2nd ANNUAL ELIZABETHTOWN COLLEGE SYMPOSIUM ON SUSTAINABILITY

Tuesday, April 23, 2013 Gibble Auditorium 9:30am to 12:30pm (Posters at 1:15pm in Lobby)

-----Session 1-----



#1 9:30 AM “High-end Phoenix Contact Technologies for International Green Initiatives” by James Kelly

#2 9:40 AM “Reflections from 16 Months of Interdisciplinary/Multicultural Collaboration on a West African Social Business Start-Up”

by Jillian Casey, Jennifer Hughes, Eleanor McCarthy, Joshua Rowlands, Emily Vogel, Julia Ward, and Nicholas Young

#3 10:00 AM “Next Steps in Continuing Work Toward West African Social Business Start-Ups – New Product Development”

by Anthony Fraccica, Joshua Frey, and Courtney Warlick

#4 10:15 AM “Family EcoRise”

by Vaclav Hasik

#5 10:30 AM “Proposed Design to Replace a New Jersey Vacation Home Destroyed by Hurricane Sandy”

by Emily Vogel



-----*Session 2*-----



#6 11:00 AM “SWOT Analysis of a Sustainable Entrepreneurial Ecosystem in Costa Rica”

by Kyle McNulty and Derek Zrnec



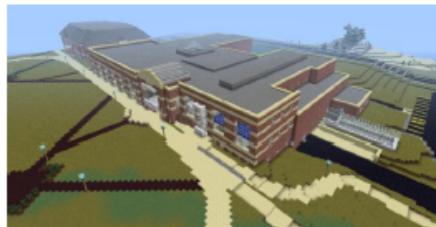
#7 11:15 AM “Computer Controlled Hydroponic Gardens”

by Sean Flannigan and Andrew Khela



#8 11:30 AM “Analyzing the Hydrological Impacts of a Proposed Sports/Recreation/Fitness Center at Elizabethtown College”

by Deborah Bartyczak, Josh Rowlands, Emily Vogel, and Nick Young



#9 11:45 AM “FEAST(Future Energies and Sustainable Technologies) Club Activities”

by James Annab, Jack Hess, Matt Klempa, and Anthony Fraccica

#10 12:00 PM “Social-networking, Crowd-sourcing Teamwork to Rapidly-Prototype Green Architecture and Communities”

by Ricky Sturz



#11 12:15PM “Solar Decathlon Charette” *by Vaclav Hasik*

-----*Posters*-----

(1:15PM in Lobby): “LEED (Leadership in Energy and Environmental Design) Architectural Design”

by Shane Weller, Kyle Wilt, Meghan Donahue, Emily Vogel, and Vaclav Hasik

Design in Social-net

CONCLUSIONS

- Rapid modeling and design
- Design in ever-changing biomes (including AI-enhanced animals)
- Grow crops, channel water, simulate flame-spread
- Interact with other designer-avatars
- Interact with non-designer-avatars (e.g., inhabitants)
- Recruit architectural and engineering students from young ages
- ~12 to ~30 year olds already live in Social Nets
- Participate from anywhere on earth
- An ongoing charette
 - potentially earn LEED credits?
- Interdisciplinary collegiality and shared stewardship of earth
- Facilitate peaceful civilizations as well as the built environment

Design in Social-net

FUTURE

- Use methodology in Architectural Studios beginning 2014
- Propose methodology to Italian affiliates
 - University of Trento
 - Pantheon Institute in Rome
- Collaborate with U.N.
- Collaborate with Mojang
- Write “Mods” (change animal or weather behavior)
- Teach Massive Open Online Course (MOOC)
- Full-immersion virtual-reality classrooms & labs with real-time language translation, and lifelike avatars
- Minecraft/UN “Block by Block” concept in developed countries

Design in Social-net

New release of Tsojin server



FUTURE

[VIDEO](#)



Apartments built in two hours by 16 students

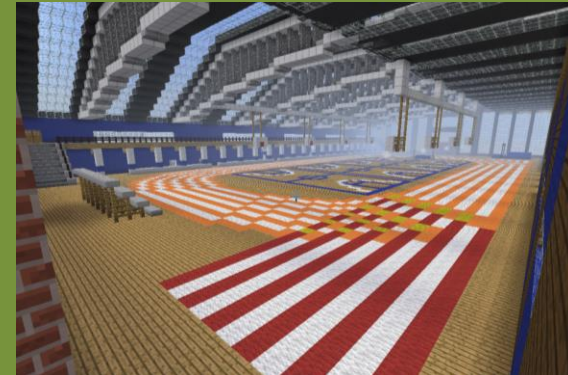
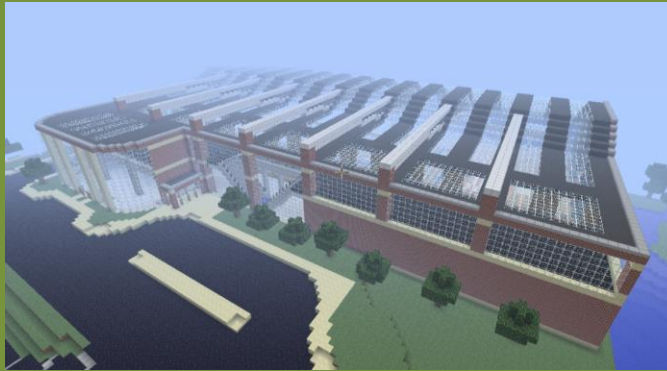
(only footprint created in advance)

VIDEOS



[VIDEO](#)

Field-House/Wellness-Center, Campus



[VIDEO](#)

Tsojin

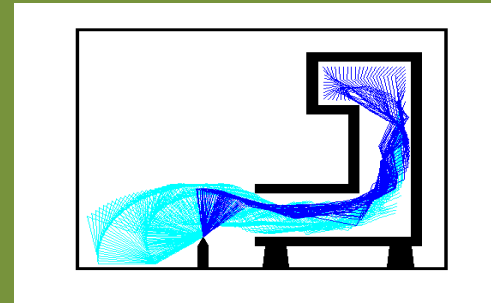
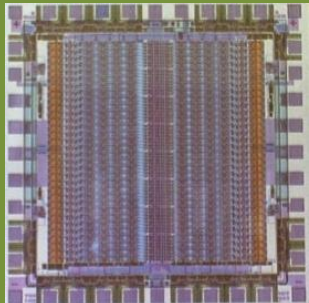


[VIDEO](#)

FUTURE

Merge

Modeling in Social Net
with other research in
Wunderlich
Robotics & Machine
Intelligence Lab
and at
WUNDEResin EAST



THIS SLIDE ADDED IN 2022

- In 2014, one year after the 2013 Keynote talk in Japan (above), a shorter 20 minute talk was given in London England including updates of student Japanese towns built, plus many case studies

AGENDA

Case 1: United Nations Projects by Others

Case 2: Initial Designs

Case 3: Building on Public Servers in Creative Mode

Case 4: Building on Public Servers in Survival Mode

Case 5: Building on Public Faction Servers

Case 6: Creating a Protected Creative Server

Case 7: Creating a Protected Survival Server

Case 8: Creating Sustainable Towns

Case 9: Wellness Center Competition #1

Case 10: Creating a Digital-Circuit Design World

Case 11: Creating a Multi-World Server

Case 12: Rapid Prototyping Real-World Architectures

Case 13: Building College Campus

Case 14: Group-build of two Dormitories in Two Hours

Case 15: Group-build of Engineering Center in Two Hours

Case 16: Visit to Australian Architectural Server

Case 17: Creating a Japanese Group-Harmony Server

Case 18: Creating Four Japanese Towns

Case 19: Wellness Center Competition #2

Case 20: Creating a European Architecture World

Case 21: Creating a LEED and ISO Green World

Wunderlich, J.T. and Wunderlich, J.J. (2014). **Crowdsourced Architecture and Environmental Design**. *2nd International Conference on Emerging Trends in Engineering and Technology (ICETET'2014)* May 30-31, **London** (United Kingdom). [TALK PAPER](#) (Also a Session Chair)

THIS SLIDE ADDED IN 2022

- In 2020 Entire campus modeled in professional architectural software (Revit), and then interfaced with oculus rift VIRTUAL REALITY



2020 Etown Oculus Rift VR of Campus in 1924 and Present, in ...

363 views • 1 year ago

All buildings including most interiors of the present Elizabethtown College Campus, and the 1924 campus, were rendered in Revit and then ported into Virtual Reality. A programmed switch is implemented for the user in VR to switch time frames.

All work done by Joseph John Wunderlich IV (2019 Portfolio: ...



<https://www.youtube.com/watch?v=bLoIORrLi3o>

- New course in Computer Game Design & Virtual Reality to be launched in the Fall of 2023