Reconstructing the World in 3D: Bringing Games with a Purpose Outdoors

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What problems can we solve with games?
von Ahn - GWAPs
Foldit – protein folding
What can we accomplish with games played away from the desk?

*More possibilities*

*More challenging to create*
Interfaces
Capture flags for your team and conquer buildings.

Look for flags on the map.

Go outside and take pictures of buildings.

Add pictures to flags.

Computer vision algorithms.
Design Challenges

1. Motivating players
2. Directing player effort
3. Visualizing the game world
4. Getting players outside
Motivating Players

Challenge #1
This photo added 826 points to model Gerberding Hall!

Scoring: 3D points = game points

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Ownership

Owning flags and models leads to engaging territorial battles
Authorship

Players can start their own seed models from small photo collections
School Rivalries

UW and Cornell competed for fame, glory, and laser-etched trophies.
Directing Player Effort

Challenge #2
Just collecting points is not enough!
Flags
Short and long term goals

Your photo added 500 points!
Gems

Gems motivated exploring and completing backs of buildings
Conveying the Game World

Challenge #3
(GTA 4)
Maps

Maps provide global view of existing geometry, teams, and ownership.
Photo-specific feedback

Players can see exactly what each photo contributed to the game world

Image R0052404.jpg added 826 points to model Gerberding Hall

New Points in Orange!
Point clouds

Streaming video and interactive viewer for raw geometry
video
Getting Players Outside

Challenge #4
Minigame

Get familiar with PhotoCity flag mechanics without going outside
iPhone app

Take photos and upload them on the go, get instant feedback
Game Trials
UW Trial (Winter 2009)

- 2 months
- 25 people submitted photos
- 12,000 photos total
- 13 models
- ~130 photos / day
UW vs. Cornell Competition

• 3 weeks
• 40 active players
• 76,356 photos uploaded
• 127 models

• ~ 3,600 photos / day
  – Reason? Players could start their own models
UW vs. Cornell (Spring 2010)
Evaluation

Rome in a Day vs. PhotoCity
Future Research

• Could a more popular, but more casual PhotoCity game be more effective?

• How else can human players help us reconstruct cities in 3D?

• What other large-scale computational problems could people accomplish by playing games out in the real world?
What's going on?

Play PhotoCity now at the Smithsonian Folklife Festival to recreate museums in 3D!

Learn more about:
PhotoCity
Smithsonian Folklife Festival

Join now!

Sign up here to play the game to win prizes!
We invite you to play PhotoCity!
http://photocitygame.com

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