

Online Ballooning Portal

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What is the portal?

An all inclusive online ballooning toolkit:

- Planning
- Prediction
- Tracking
- Analysis
- Sharing

Why are we doing this?

- 2012 AHAC identified a desire to easily share data
- Beginners frequently launch without a prediction due to perceived difficulty
- Shared data can fill gaps and provide examples
- “Big data” enables statistical modelling

Objectives

- Simple interface to detailed prediction engine
- Plug and play tracking system
- Seamless telemetry storage
- Easy data sharing
- Straightforward data presentation
- **Open source and community driven**

Prior work

Prediction

- Near Space Ventures
- HabHub - UKHAS
- ASTRA - University of Southampton

Tracking

- aprs.fi, openaprs.net, etc...
- Spacenear - UKHAS

HabHub Predictor

The screenshot displays the 'CUSF Landing Predictor 2' web application. The browser address bar shows the URL: `predict.habhub.org/#!/uid=cec0e597ac0bee6e29b79cadc235a335383a8a4f`. The map shows a flight path starting from Grand Forks, ND, heading east towards Thief River Falls, MN, and then looping back. The configuration panel on the right contains the following information:

Scenario Information
Current mouse position: Lat: 48.0928 Lon: -96.2251
Range: 49.8km, Flight Time: 2hr15
Cursor range from launch: 61.5km, land: 25.0km
Last run at 02:36 26/06/2014 UTC using model 2014062518
[Pan To | CSV | KML](#)
[Show Debug | Hide Launch Card | About](#)

Launch Site: Custom (Other selected)
Latitude/Longitude: 47.9 / -97
Set With Map: Save Location
Launch altitude (m): 300
Launch Time (UTC): 13 : 00
Launch Date: 26 Jun 2014
Ascent Rate (m/s): 5.23
Burst Altitude (m): 28681
Use Burst Calculator
Descent Rate (m/s): 5
[Run Prediction](#)

ASTRA Predictor

ASTRA High Altitude Balloon Flight Planner

Created by Niccolò Zapponi • Status updates on Twitter
How does it work? • Report a bug • Credits • Terms of use • Cookies regulations

Export and view options Mark GPS location Map Satellite

UNIVERSITY OF Southampton

Gas type
Helium Hydrogen

Balloon model
Hwoyee 1.2kg

Parachute model
Spherachute 60"

Payload weight
5.44 kg

Nozzle lift
7.26 kg

Train equivalent sphere diameter
0.2 m

LAUNCH SITE

WEATHER DATA

SIMULATION SETTINGS

RUN THE SIMULATION

Map data ©2014 Google 2 km Terms of Use Report a map error

APRS.fi Tracker

Google Maps APRS

aprs.fi/#!mt=roadmap&z=11&call=a%2FWOISU-10&timerange=3600&tail=3600

42°8.58' N 93°11.24' W, EN32JD

Overlays Map

aprs.fi · Login

Track callsign: Clear

Address, city or Locator: Clear

Show last: 1 hour Show all

Track tail length: 1 hour

WOISU-10

Updated: 2014-04-18 20:52:04 (68d54m)
Position: 41°56.54' N 93°20.37' W

2012 2013 2014

Other SSIDs: WOISU-11 WOISU-7

WOISU-9
Wx: 73.9°F 69% 1013 mbar 0.0 MPH SE

Other views:

- Station info
- Raw packets
- Status packets - Beacon packets
- APRS/CWOP weather - Telemetry
- Messages - Bulletin board
- Prefix browsing
- Google Earth KML ?
- Data export tool
- Preferences - My account

Information:

Stations currently moving · User guide · FAQ · Blog · Discussion group · Linking to aprs.fi · AIS sites · Service status · Database statistics · Advertising on aprs.fi · Technical details · API · Change log · Planned changes · Credits and thanks · Terms Of Service

Map data ©2014 Google 2 km Terms of Use Report a map error

WOISU-10 - center · zoom · info

2014-04-18 20:52:04

17 MPH 144° alt 56752 ft

V2D4 /u204

[APBL10 via WIDE1-1,WIDE2-1,6AR,AUBURN]

being tracked · stop tracking · track in Street View

Spacenear Tracker

The screenshot shows the Spacenear Tracker web application interface. The browser address bar displays "spacenear.us/tracker/". The page features a map of Europe and the Middle East with several satellite tracking icons. A red line traces a path across the map, starting from the British Isles and extending towards the Caspian Sea. Three detailed data panels are visible on the right side of the map:

- B-60**
 - Time: 2014-06-23 15:16:53
 - Position: 43.9691,49.4351
 - Altitude: 10334 m Rate: -0.0 m/s
 - Max. Altitude: 10887 m
 - Temperature: 4C
 - Battery: 4.38 V
 - Date: 140623
 - Satellites: 7
 - Solar Panel: 0.63
 - Receivers: APRS
- WG2**
 - Time: 2014-06-26 02:36:34
 - Position: 51.3437,4.408
 - Altitude: 4075 m Rate: -0.2 m/s
 - Max. Altitude: 7830 m
 - Speed: 317.8 km/h
 - Battery: 1.43 V
 - Flags: 34608200
 - Satellites: 8
 - Temperature: -8 °C
 - Vcc: 1.99
 - Receivers: PE2G, PB0AHX, RevSpace
- X1**
 - Time: 2014-06-25 14:43:11
 - Position: 52.0957,-1.02221
 - Altitude: 100 m Rate: -0.0 m/s
 - Max. Altitude: 341 m
 - Temperature: 31C
 - Battery: 4.29 V
 - Satellites: 5
 - Receivers: Leo

The interface also includes a chat window for "SPACENEAR.US" with the text "Come chat to us: #highaltitude on irc.freenode.net" and "Current time is : 02:37 UTC". A navigation menu at the top includes "Map", "B-60", "WG2", "X1", and "Settings". The bottom of the page shows "Received 0 new positions." and "Track in Google Earth".

No good solution so far

- No telemetry storage
- No data analysis
- No seamless sharing
- No start to finish solution

Proposed solution

Create a flight

- Parameter entry
- Rough predictions
- Tracking/telemetry definition
- Schedule flight
- Paperwork generated
- Announcement issued
- Flight page posted on website

Proposed solution

Tracking

- Confirm launch parameters
- Telemetry stations upload data
- Track and predictions updated live
- Paperwork generated
- Graph live telemetry
- Update status on website

Proposed solution

Analysis

- Export data
- Plot data
- Generate reports
- Analyze prediction accuracy
- All data attached to flight page

Proposed solution

Sharing data

- Browse prior flights
- Search for flights using mission parameters
- Search for data using attributes and tags

Current work

HABtk

- Bulk predictions
- Tracking/logging
- Telemetry upload
- Real-time predictions

HABtk

HABtk - 0.01 Alpha

File Tracking Help

Prediction

Flight:
Kaymont 600: 1.12kg neck lift

New Open Edit

Start Time: 2012-05-11 12:00 Pick

Stop Time: 18:00 Pick

Interval (hr): 3 Days out: 7

100%

Run

Prediction Map

Tiles courtesy of MapQuest.com
Map data © OpenStreetMap contributors, CC-BY-SA

Prediction List

Show	Launch Time (UTC)	Balloon Type	Lift (kg)	Time Aloft	Distance (km)	Altitude (km)
<input checked="" type="checkbox"/>	2012-05-17 15:00	Kaymont 600	1.12	02:23:30	56.09	31.532
<input checked="" type="checkbox"/>	2012-05-16 15:00	Kaymont 600	1.12	02:23:00	49.28	31.375
<input checked="" type="checkbox"/>	2012-05-16 12:00	Kaymont 600	1.12	02:23:00	58.08	31.375
<input checked="" type="checkbox"/>	2012-05-17 18:00	Kaymont 600	1.12	02:23:30	56.02	31.532
<input checked="" type="checkbox"/>	2012-05-16 18:00	Kaymont 600	1.12	02:23:00	36.72	31.375
<input checked="" type="checkbox"/>	2012-05-17 12:00	Kaymont 600	1.12	02:23:30	56.68	31.532

1: Log

Current work

Stratocast

- Guided predictions
- Simplified quick predictions
- Reverse predictions
- Balloon burst calculator
- Simplified interface
- Mobile/tablet compatible

Stratocast

Stratocast - Online HAB FI x

stratocast.stratoballooning.org/#pred/results

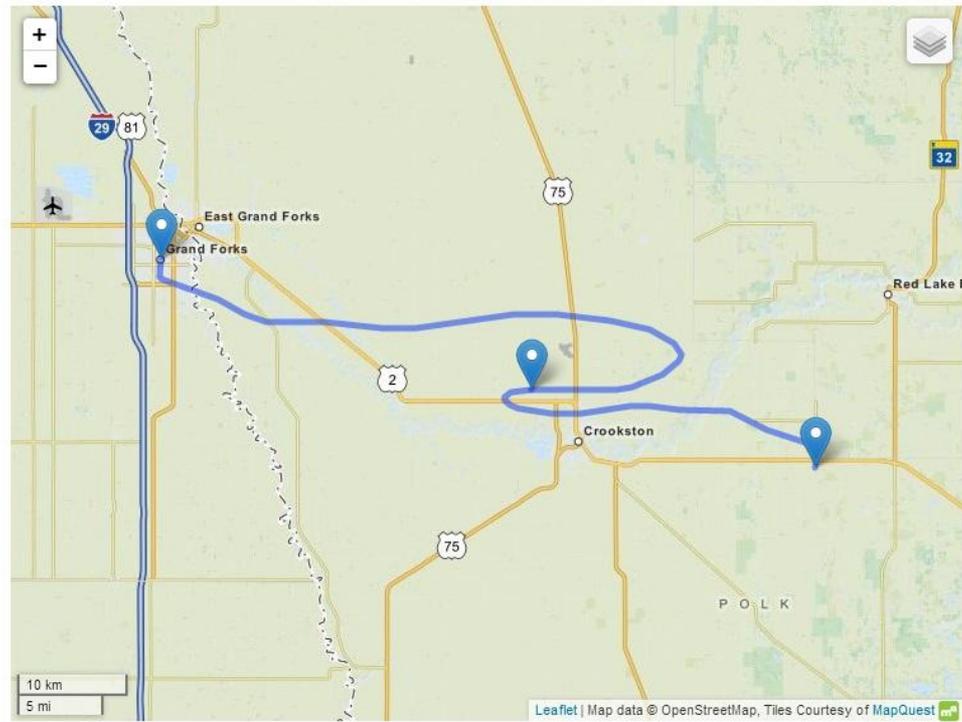
Apps Weather Git Branching Course Notes - Coo...

Stratocast Contact About

Metric English

Prediction Results

Overview	Elapsed Time	2:14:20
	Total Distance	55.371 km
	Bearing	107.56
	Ascent Rate	5.498 m/s
Launch	Time	5/26/2014 8:00
	Ascent Time	1:30:30
	Location	47.908, -97.059
	Altitude	253 m
Burst	Time	5/26/2014 9:30:30
	Location	47.812, -96.659
	Altitude	30.108 km
Landing	Time	5/26/2014 10:14:20
	Descent Time	0:43:50
	Location	47.755, -96.353



Current work

Platform planning

- Requirements definition
- Standards development
- Database development
- Website integration

Current work

Standards development

- Interoperability
- Data description
- Telemetry/telecommand description

Current work

Predictor development

- Atmospheric data interpolator
- Float predictor
- Zero-pressure predictor
- Wind extraction and assimilation

Future work

- Statistical modelling
- Automatic performance evaluation
- Distributed tracking network
- Universal SDR transceiver

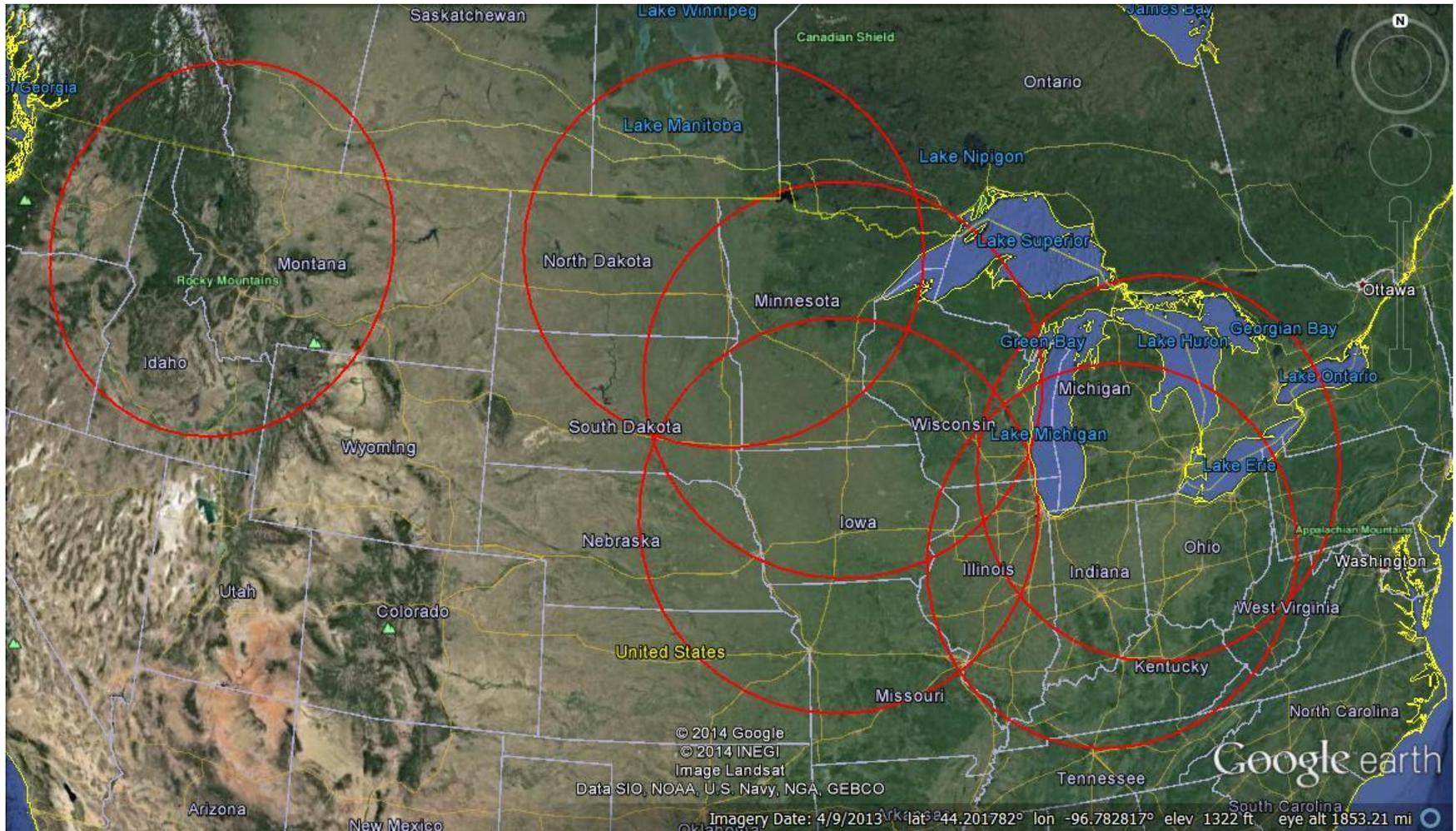
Modelling & evaluation

Modelling is difficult:

- Drag crisis
- Thermal effects
- Different manufacturers

Machine learning can help identify statistical models and continuously evaluate model performance.

Distributed tracking



Get involved

- Feature requests
- Planning
- Programming
- User experience design
- Testing
- Flight data

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