

Data management

from georeferenced data to data storage and access

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Review

- Raw sensor outputs to georeferenced data
 - Convert latitude and longitude to UTM coordinates
 - Assign coordinates to each sensor location based on vehicle geometry
 - Locate sensor observation points within field plot boundaries
 - Assign field plot ID information to each sensor observation point

Data interpretation

SN	Plot_ID	Sensor_ID	Observation	ASP_x	ASP_y	Elevation	Sampling time	Date
823415	13ASH10074	IRT_3111651	23.03	705759.0678	4334166.54	312.14	14:10:16	5/24/2013
823416	13ASH10076	IRT_2081797	23.5	705759.0583	4334164.756	312.14	14:10:16	5/24/2013
823417	13ASH10072	IRT_2081803	23.41	705759.174	4334168.116	312.12	14:10:16	5/24/2013
823418	13ASH10074	IRT_3111651	23.01	705759.1654	4334166.535	312.12	14:10:16	5/24/2013
823419	13ASH10076	IRT_2081797	23.51	705759.1558	4334164.758	312.12	14:10:16	5/24/2013
823420	13ASH10072	IRT_2081803	23.27	705759.174	4334168.116	312.12	14:10:16	5/24/2013
823421	13ASH10074	IRT_3111651	22.96	705759.1654	4334166.535	312.12	14:10:16	5/24/2013
823422	13ASH10076	IRT_2081797	23.52	705759.1558	4334164.758	312.12	14:10:16	5/24/2013
823423	13ASH10072	IRT_2081803	23.24	705759.264	4334168.114	312.14	14:10:16	5/24/2013
823424	13ASH10074	IRT_3111651	22.95	705759.2556	4334166.526	312.14	14:10:16	5/24/2013

- Instrument information
- Physical information
- Temporal information
- Geographical information
- Field plot information

Data management

- HTP data table
 - Sensor ID
 - Sensor output(s)
 - Absolute sensor positions
 - UTM zone
 - Sampling date and time
 - Plot ID
 - Others (i.e. raw GPS outputs)

Data management

- HTP data table

SN	Sensor ID	Observation	Sensor Position X	Sensor Position Y	Sensor Position Z	UTM Zone	Time	Date	Plot ID
123415	GSK_5239J00111	0.635	470545.7181	4300902.733	311.83	14S	13:30:23	5/8/2013	12HAY00036
123416	GSK_5239J00112	0.715	470545.7227	4300902.404	311.83	14S	13:30:24	5/8/2013	12HAY00036
123417	GSK_5239J00113	0.723	470545.7056	4300902.088	311.8	14S	13:30:24	5/8/2013	12HAY00036
123418	GSK_5239J00111	0.703	470545.718	4300901.921	311.8	14S	13:30:24	5/8/2013	12HAY00036
123419	GSK_5239J00112	0.687	470545.7399	4300901.59	311.78	14S	13:30:25	5/8/2013	12HAY00036
123420	GSK_5239J00113	0.683	470545.6534	4300901.276	311.78	14S	13:30:25	5/8/2013	12HAY00036

Data management

- Field plot table
 - Plot ID
 - Seed ID
 - Range and column index
 - Planting date
 - Boundary coordinates
 - Others (i.e. field location)

Data management

- Field plot table

SN	Plot ID	Seed ID	Range	Column	Planting date	NW X	NW Y	NE X	NE Y	SE X	SE Y	SW X	SW Y
1435	13BYD00217	12ASH10025B	7	7	9/19/2013	470545.4	4300902.8	470546.1	4300903	470546.1	4300901	470545.4	4300901
1436	13BYD00218	12ASH10017B	7	8	9/19/2013	470545.3	4300899.6	470546	4300900	470546	4300898	470545.3	4300898
1437	13BYD00219	12ASH10006B	7	9	9/19/2013	470545.1	4300896.6	470545.8	4300897	470545.8	4300895	470545.1	4300895
1438	13BYD00220	12ASH10040B	7	10	9/19/2013	470545.1	4300893.5	470545.8	4300894	470545.8	4300891	470545.1	4300891
1439	13BYD00221	12ASH10038B	8	10	9/19/2013	470545.1	4300890.4	470545.8	4300890	470545.8	4300888	470545.1	4300888
1440	13BYD00222	12ASH10007B	8	9	9/19/2013	470545	4300887.4	470545.7	4300887	470545.7	4300885	470545	4300885

Data management

- Instrumentation table
 - Sensor ID
 - Model type
 - Serial number
 - Relative positions on the phenotyping system
 - Others (i.e. phenotyping system information)

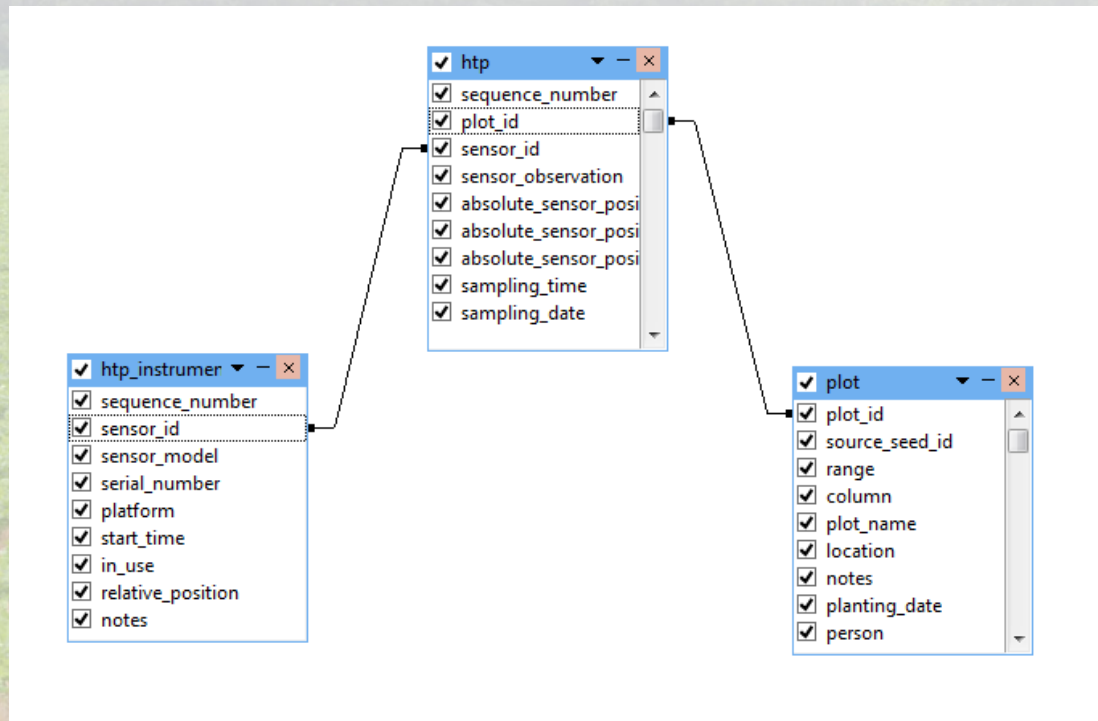
Data management

- Instrumentation table

SN	Sensor ID	Model No.	Serial No.	Relative Position X	Relative Position Y	Relative Position Z
1	GSK_5239J00111	900-1-009-EM	5239J00111	4.39735	0.74295	0.53975
2	GSK_5239J00113	900-1-009-EM	5239J00113	4.39735	0.74295	0.53975
5	CCL_AC000304	ACS-470	AC000304	4.39735	0.74295	0.53975
6	CCL_AC000262	ACS-470	AC000262	4.39735	0.74295	0.53975
7	IRT_2081803	CT-SF02-C1	2081803	4.39735	0.74295	0.53975
8	IRT_3111651	CT-SF02-C1	3111651	4.39735	0.74295	0.53975
14	USC_201302	Q45ULIU64BCR	201302	4.39735	0.74295	0.53975
15	USC_201303	Q45ULIU64BCR	201303	4.39735	0.74295	0.53975
16	LAS_201401	LT3NUQ	201401	4.39735	0.74295	0.53975

Data management

- Relationship between tables



Data management

- Storage and access
 - File (i.e. CSV files)
 - Database (i.e. relational database)

Discussion

- What are the final goals for the your phenotyping data?
- How do you envision archiving and accessing your phenotyping data for analysis purpose?
- What new software tools would be helpful to you?
- How should these software tools be designed?
- Other thoughts?

Lecture presented at:
Field Phenomics Workshop
Maricopa Agricultural Center
Maricopa, AZ
April 7-10, 2014

For further material relating to field phenomics and information on future workshops, visit fieldphenomics.org.