

ARGroup

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Project Idea

We collaborated with Samantha Siu of the CGUI lab in the development and testing of her Making & Knowing application. The areas of help she requested was in testing of her application and designing of a test database in which the entire process of following a recipe and user's annotation at each step is readily available.

Database Architecture

Technologies

Google Cloud

MySQL

Unity



Google Cloud



MySQL®

Preprocessing annotation-metadata.csv

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	Annotation ID	Listing (folder na	Year	Semester	Theme	text_folder	annotation_file	UUID	GD_folder_url	GD_text_url	thumbnail_url	abstract_text_url	bib_text_url	Title	Author	Folios	Entry ID	abstract/bib crea	Present in log 20	Status 2018-10-10
2	ann_999_fa_99	"Stucco-example	2099	Fall	Example	Text_	"Stucco-exi	AnnotationFall20	1_Q, C3Zq9sNS	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Stucco-example	Editor, General	029r	p029r_1	N - created 2018-10-10	
3	ann_001_fa_14	"Wax-Tallow," fol	2014	Fall	Moldmaking and	Text_	"Wax-Tallow	AnnotationFall20	1307GL5qovGyY	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Wax-Tallow	Cataldo, Visco	109r	p109r_1	Y	Y	
4	ann_002_fa_14	"One-Sided Holc	2014	Fall	Moldmaking and	Text_	"One-Sided	AnnotationFall20	1K5vL_wtNCUJW	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	One-Sided Hollo	Landsman, Row	092r	p092r_2	Y	Y	
5	ann_003_fa_14	"Molded Roses,"	2014	Fall	Moldmaking and	Text_	"Molded Rc	AnnotationFall20	10_kjBnJ67qrv	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Molded Roses	Carlson, Katz	129r	p129r_4	Y	Y	
6	ann_003_fa_14	"Molded Roses,"	2014	Fall	Moldmaking and	Text_	"Molded Rc	AnnotationFall20	10_kjBnJ67qrv	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Molded Roses	Carlson, Katz	155r	p155r_1	Y	Y	
7	ann_003_fa_14	"Molded Roses,"	2014	Fall	Moldmaking and	Text_	"Molded Rc	AnnotationFall20	10_kjBnJ67qrv	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Molded Roses	Carlson, Katz	155v	p155v_1	Y	Y	
8	ann_004_fa_14	"Original Pattern	2014	Fall	Moldmaking and	Annotation text_	"AnnotationFall20	1NnRe2CYp25d	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Original Patterns	Landsman, Rowen			N - Manually ent	N	
9	ann_005_fa_14	"Molded Letter P	2014	Fall	Moldmaking and	Text_	"Molded Le	Annotation_Fall2	180qnSFdJneEI	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Molded Letter Pe	Carlson, Katz	131r	p131r_2	Y	Y	
10	ann_006_fa_14	"Calcined Oyster	2014	Fall	Moldmaking and	Text_	"Calcined Oysters,"	fol. 84v (Cataldo, Visco)	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Calcined Oysters	Cataldo, Visco	084v	p084v_2	N - Manually ent	N - M&K	
11	ann_007_fa_14	"Sulfur and Addit	2014	Fall	Moldmaking and	Text_	"Sulfur and	AnnotationFall20	1RT9VZ5lct0x_6	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Sulfur and Additi	Landsman, Row	140v	p140v_1	Y	Y	
12	ann_007_fa_14	"Sulfur and Addit	2014	Fall	Moldmaking and	Text_	"Sulfur and	AnnotationFall20	1RT9VZ5lct0x_6	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Sulfur and Additi	Landsman, Row	012r	p012r_1	Y	Y	
13	ann_008_fa_14	"Excellent Musta	2014	Fall	Moldmaking and	Text_	"Excellent M	AnnotationFall20	1N0GLIYHerzh-q	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Excellent Mustar	Mellon	048r	p048r_3	Y	Y	
14	ann_009_fa_14	"Magistry," fol. 84	2014	Fall	Moldmaking and	Text_	"Magistry,"	AnnotationFall20	12IQKzykn8J--fr	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Magistry	Lee	084r	p084r_3	Y	Y	
15	ann_010_fa_14	"Casting in a Box	2014	Fall	Moldmaking and	Text_	"Casting in	AnnotationFall20	1aBJDQ2p3E8B	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Casting in a Box	Carlson, Katz	118v	p118v_1	Y	Y	
16	ann_011_fa_14	"Sands and Bind	2014	Fall	Moldmaking and	Text_	"Sands and Binders,"	fol. 82r, 84v (Cataldo, Vis	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Sands and Binde	Cataldo, Visco	082r	p082r_3	N - Manually ent	N - M&K	
17	ann_011_fa_14	"Sands and Bind	2014	Fall	Moldmaking and	Text_	"Sands and Binders,"	fol. 82r, 84v (Cataldo, Vis	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Sands and Binde	Cataldo, Visco	084v	p084v_2	N - Manually ent	N - M&K	
18	ann_012_fa_14	"Ox Bone and R	2014	Fall	Moldmaking and	Annotation text_	"AnnotationFall20	1nE-vuGwOf-2L	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Ox Bone and Ro	Wang	089r	p089r_1	N - Manually ent	N	
19	ann_013_sp_15	"Too Thin Things	2015	Spring	Moldmaking and	Text_	"Too Thin T	AnnotationSpring	1sLKUY56opxL5	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Too Thin Things	Fu, Zhang	142v	p142v_1	Y	Y	
20	ann_014_sp_15	"Founders of Sm	2015	Spring	Moldmaking and	Text_	"Founders (	AnnotationSpring	1H1XkpYLarFco	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Founders of Sm	Chiostrini, Palfr	080v	p080v_1	Y	Y	
21	ann_015_sp_15	"Imitation Coral,"	2015	Spring	Moldmaking and	Text_	"Imitation C	AnnotationSpring	1aBY9s8N6Vm	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Imitation Coral	Chessa	003r	p003r_1	Y	Y	
22	ann_016_sp_15	"Alabaster Sand,	2015	Spring	Moldmaking and	Text_	"Alabaster (	AnnotationSpring	142dGr18L0dy	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Alabaster Sand	Gans	083r	p083r_6	Y	Y	
23	ann_017_sp_15	"Sugar Casting,"	2015	Spring	Moldmaking and	Text_	"Sugar Cas	AnnotationSpring	19NU-U8hC0Jg	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Sugar Casting	Durkin	126r	p126r_1	Y	Y	
24	ann_018_sp_15	"Knowledge Excl	2015	Spring	Moldmaking and	Text_	"Knowledge	AnnotationSpring	1XmoVEaln5Ub	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Knowledge Exch	Gans	126v	p126v_1	N - Manually ent	N	
25	ann_019_sp_15	"Varnish for Lute	2015	Spring	Moldmaking and	Text_	"Varnish for	AnnotationSpring	1MvCkw-O3gflG	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Varnish for Lutes	Marris, Pope	098r	p098r_1	Y	Y	
26	ann_020_sp_15	"Ox Bone, Wine,	2015	Spring	Moldmaking and	Text_	"Ox Bone, (	AnnotationSpring	1BETVlbdM5pBr	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Ox Bone, Wine, ;	Marris, Pope	084v	p084v_1	Y	Y	
27	ann_021_sp_15	"Powder for Hou	2015	Spring	Moldmaking and	Text_	"Powder for	AnnotationSpring	1xskY_5wTQOT	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Powder for Hour	Pope	010r	p010r_5	N - Manually ent	N - M&K	
28	ann_022_sp_15	"Molding a Box	2015	Spring	Moldmaking and	Text_	"Molding a	AnnotationSpring	15vMj-3wTQOT	https://drive.goo	https://drive.goo	https://drive.goo	https://drive.goo	Molding a Box	Chiostrini, Palfr	155r	p155r_1	Y	Y	

Construction of notes.csv

	A	B	C	D	E	F
1	note_ID	content_type	content	coordinates	timestamp	rotation
2	note_04_26_1	photos	https://drive.google.com/file/d/11TB5Nd0ND4N7QaCPIFxeChD3NjloxqjT/view?usp=sharing	(0.0, 0.5, 5.2)	2019_04_26_13:37:06	(1.0, 2.0, 3.0, 4.0)
3	note_04_26_2	text	hello world	(1.4, 1.7, 1.5)	2019_04_26_13:37:36	(1.53, 9.27, 2.6534, 8.223)
4	note_04_26_3	videos	https://drive.google.com/file/d/1ghYNGe1pF17CNK4X-Slc0E2lo9C9prlx/view?usp=sharing	(4.6, 2.5, 3.3)	2019_04_26_13:38:06	(4.723, 2.236, 7.234, 4.73453)
5						

Building the Tables

- Converted annotation-metadata.csv and notes.csv into SQL tables

Column	Datatype	PK	NN	UQ	BIN	UN	ZF	AI	G	Default / Expression
annotation_id	VARCHAR(15)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
folder_name	VARCHAR(200)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
Year	YEAR(4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
Semester	VARCHAR(6)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
Theme	VARCHAR(100)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
text_folder	VARCHAR(200)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
annotation_file	VARCHAR(200)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
UUID	VARCHAR(60)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
GD_folder_url	VARCHAR(200)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
GD_text_url	VARCHAR(200)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
thumbnail_url	VARCHAR(200)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
abstract_text	VARCHAR(200)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL

Column details 'annotation_id'

Column Name:

Charset/Collation:

Comments:

Datatype:

Default:

Storage: VIRTUAL STORED

Primary Key Not NULL Unique

Binary Unsigned ZeroFill

Building the Tables

- Uploaded each table to the database

← Bucket details [EDIT BUCKET](#) [REFRESH BUCKET](#)





annotation-metadata

[Objects](#) [Overview](#) [Permissions](#) [Bucket Lock](#)

[Upload files](#) [Upload folder](#) [Create folder](#) [Manage holds](#) [Delete](#)

🔍 Filter by prefix...

[Buckets](#) / annotation-metadata

<input type="checkbox"/>	Name	Size	Type	Storage class	Last modified	Public access [?]	Encryption [?]	Retention expiration date [?]	Holds [?]	
<input type="checkbox"/>	 annotation-metadata - Sheet1.csv	67.77 KB	text/csv	Multi-Regional	4/24/19, 3:11:50 PM UTC-4	Not public	Google-managed key	–	None	⋮
<input type="checkbox"/>	 annotation_annotation-metadata0.sql	74.99 KB	application/octet-stream	Multi-Regional	4/24/19, 3:36:46 PM UTC-4	Not public	Google-managed key	–	None	⋮
<input type="checkbox"/>	 notes_notes - sheet1.sql	2.49 KB	application/octet-stream	Multi-Regional	4/26/19, 1:56:04 PM UTC-4	Not public	Google-managed key	–	None	⋮
<input type="checkbox"/>	 notes_notes.sql	2.42 KB	application/octet-stream	Multi-Regional	4/26/19, 2:07:09 PM UTC-4	Not public	Google-managed key	–	None	⋮

Building the Tables

- Tested if we can retrieve data from annotation-metadata table

```
Database changed
MySQL [annotations]> select annotation_ID from annotationmetadata;
+-----+
| annotation_ID |
+-----+
| ann_004_fa_14 |
| ann_057_sp_17 |
| ann_066_fa_18 |
| ann_069_fa_18 |
| ann_072_fa_18 |
| ann_075_fa_18 |
| ann_015_sp_15 |
| ann_055_sp_17 |
| ann_071_fa_18 |
| ann_034_sp_16 |
| ann_052_fa_16 |
| ann_070_fa_18 |
| ann_056_sp_17 |
| ann_054_sp_17 |
| ann_021_sp_15 |
| ann_028_fa_15 |
```

Building the Tables

- Tested if we can retrieve data from and write data to notes table

```
Database changed
```

```
MySQL [annotations]> INSERT INTO notes VALUES('note_04_29_1', 'text', 'this is my note', '(1.4, 1.7, 1.5)', '2019_04_29_13:37:36', '(1.53, 9.27, 2.6534, 8.223)');
```

```
Query OK, 1 row affected (0.01 sec)
```

```
MySQL [annotations]> █
```

Testing in Unity

User Testing

Persona 1: Tianna (Researcher in the M&K Lab)

- Reconstruct a dry flower following the steps indicated on folios 120v-121r in Ms. Fr. 640.
 - Take photos
 - Write annotations
 - Create a replicable process



Problems & Solutions for Persona 1

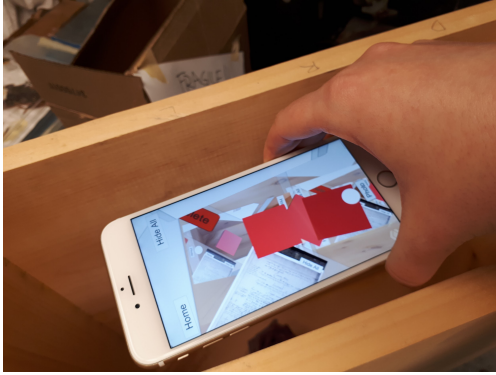


Figure 1

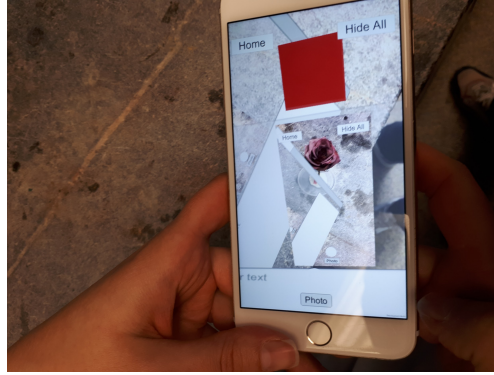


Figure 2

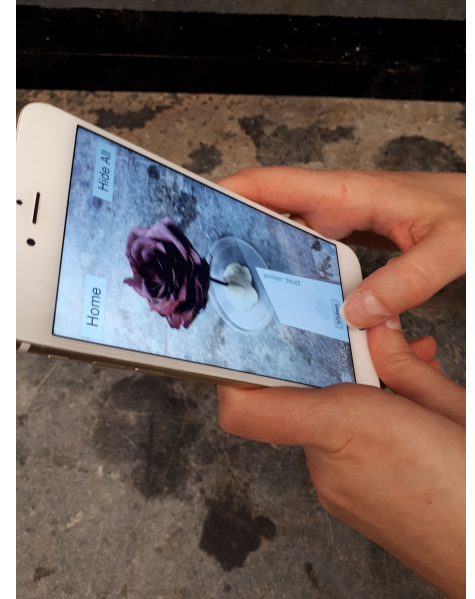


Figure 3

Persona 2: Taewan (Student in the M&K Lab)

- Understand and ultimately replicate the process previously done by Tianna
 - Red boxes (photos and annotations) are scattered all over the space
 - Move around to find each and every red box



Problems & Solutions for Persona 2

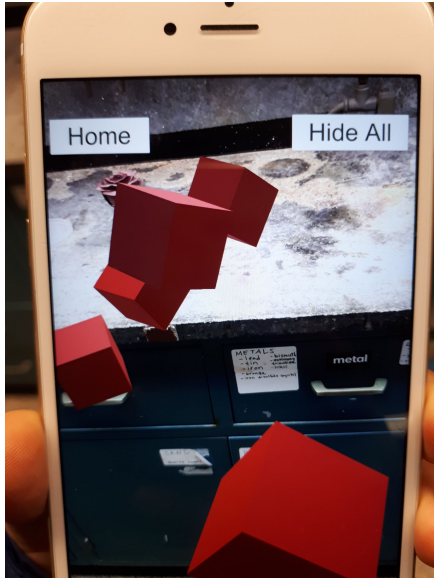


Figure 4

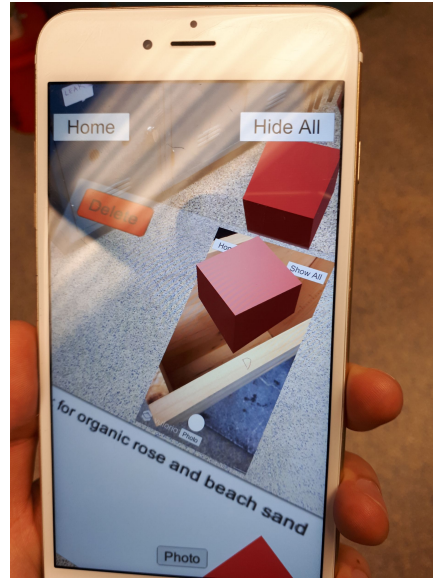


Figure 5



Figure 6

Persona 3: Mark (Reader of Ms. Fr. 640 not in NYC)

- Due to the lack of proximity from the M&K Lab, Mark wishes to learn more about and virtually experience the process of drying a flower (folios 120v-121r) by using Sam's application downloaded on his iPhone
 - Use database and cloud directly linked to the app
 - Follow instructions laid out by Tianna



Problems & Solutions for Persona 3

- ***Cloud and database storage is not an available function yet
 - Multiple potential bugs related to connection with the database
- Similar problems founded by Persona 2
 - Not a reader-mode text box
 - Difficult positioning
 - Zoom-in and zoom-out function needed

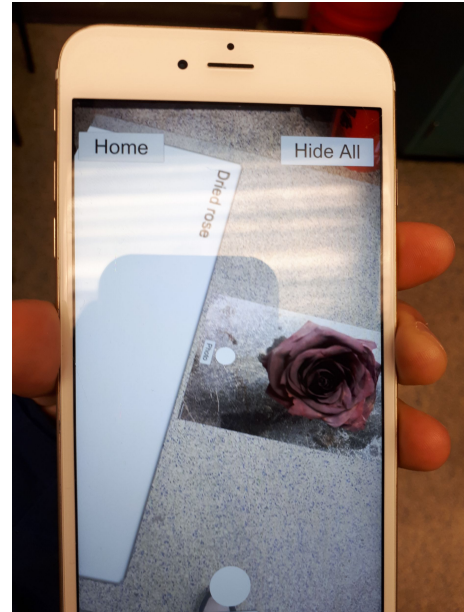


Figure 7

Thank You!