

COMP0117 - Project Presentation

# Mobile Virtual Annotator

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A presentation submitted in part fulfilment of the degree of  
**MSc (Hons) in Computer Graphics, Vision and Imaging**

Department of Computer Science  
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# Overview

## *Project Specs:*

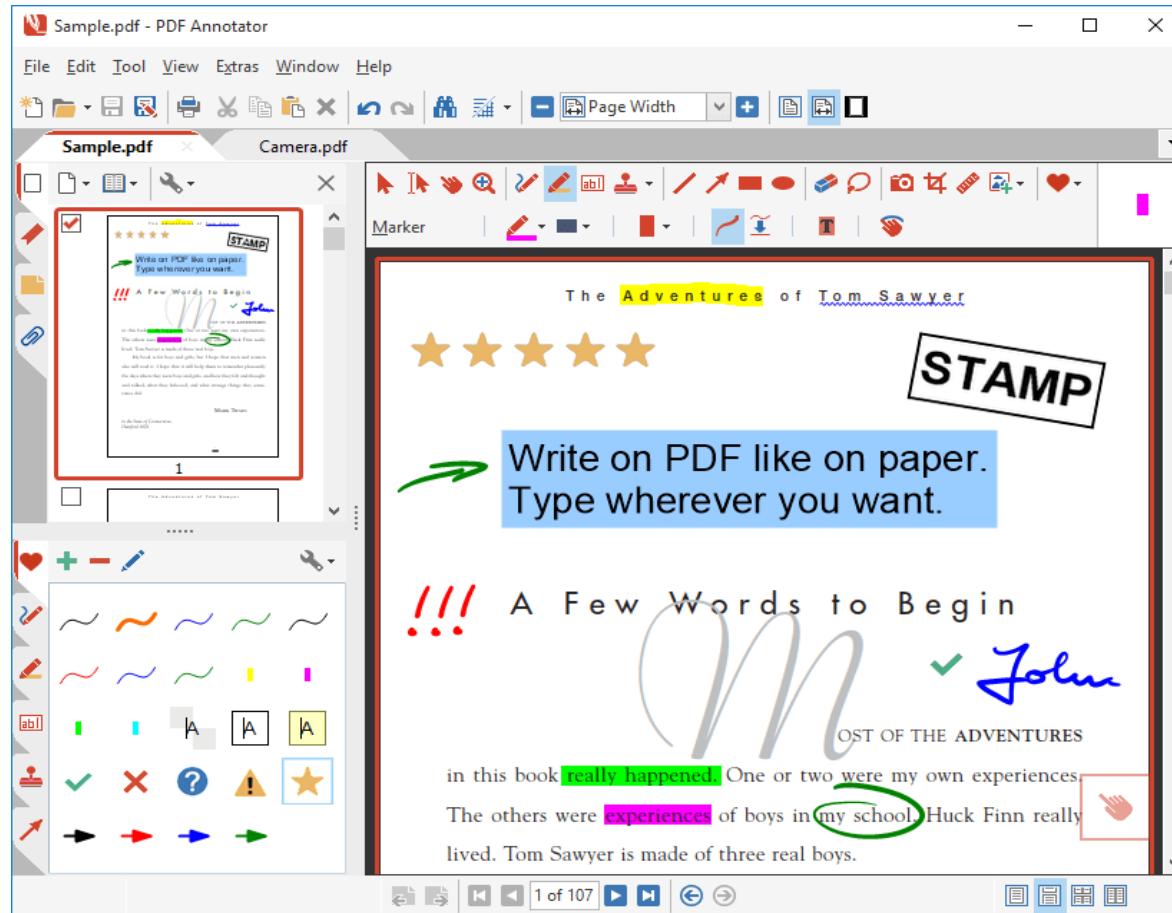
“To develop a virtual annotator for mobile devices using neural networks, depth images and point cloud environment scans.”

## *To do:*

- Initial Planning and Research
- Phases of Development
- Testing / Improving / Deploying
- Timeframe

# What is an Annotator?

“To add brief yet concise notes, explanations, comments or opinions to a text or diagram.” – Cambridge English Dictionary

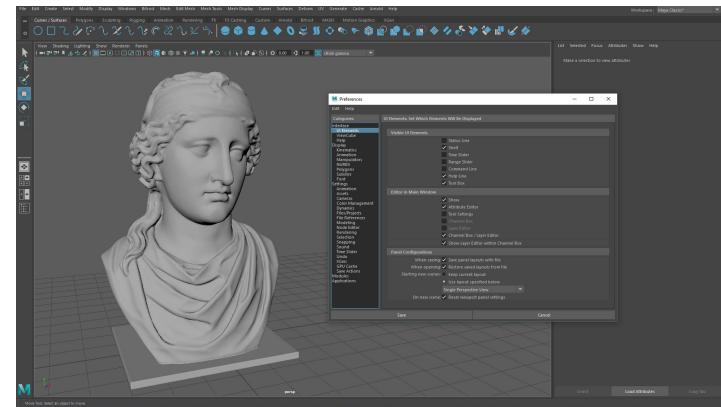


# Tools and Resources

## Python

```
31     def __init__(self, path):
32         self._path = path
33         self._fingerprint = {}
34         self._log_fp = False
35         self._debug = False
36         self._logger = logging.getLogger(__name__)
37         if path:
38             self._file = open(os.path.join(path, 'fingerprint'), 'w')
39             self._file.write('')
40             self._fingerprint[''] = ''
41
42     @classmethod
43     def from_settings(cls, settings):
44         debug = settings.getbool('logger.debug')
45         return cls(job_dir(settings), debug)
46
47     def request_seen(self, request):
48         fp = self.request_fingerprint(request)
49         if fp in self._fingerprint:
50             return True
51         self._fingerprint[fp] = os.linesep
52         self._file.write(fp + os.linesep)
53
54     def request_fingerprint(self, request):
55         return self.request_seen(request)
```

## Maya/Blender



## ARKit



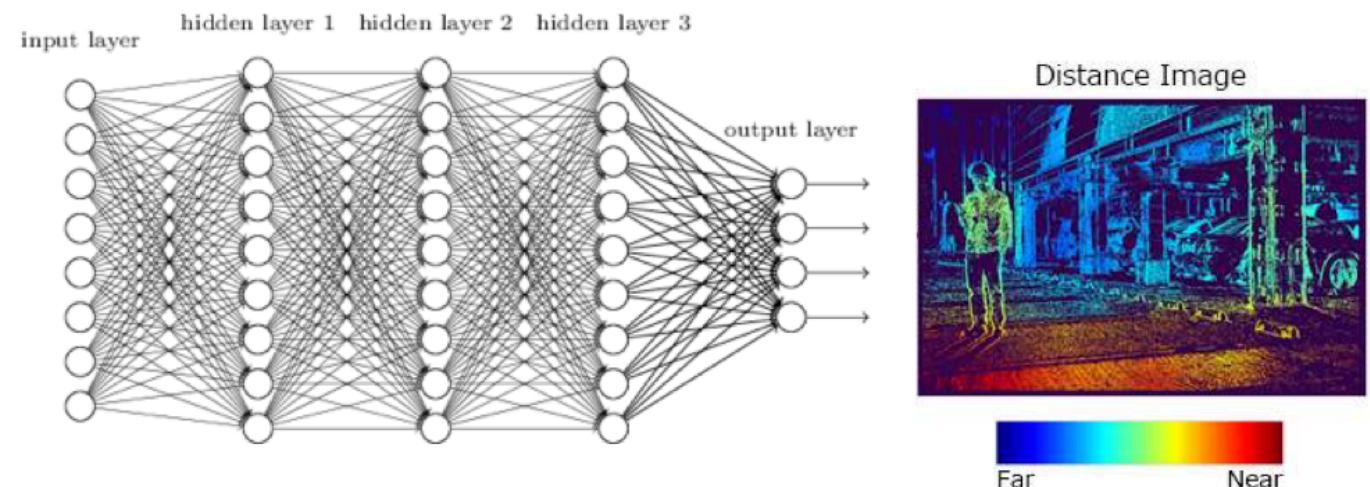
## Data-Storage Systems



# Depth-Estimation Neural Network

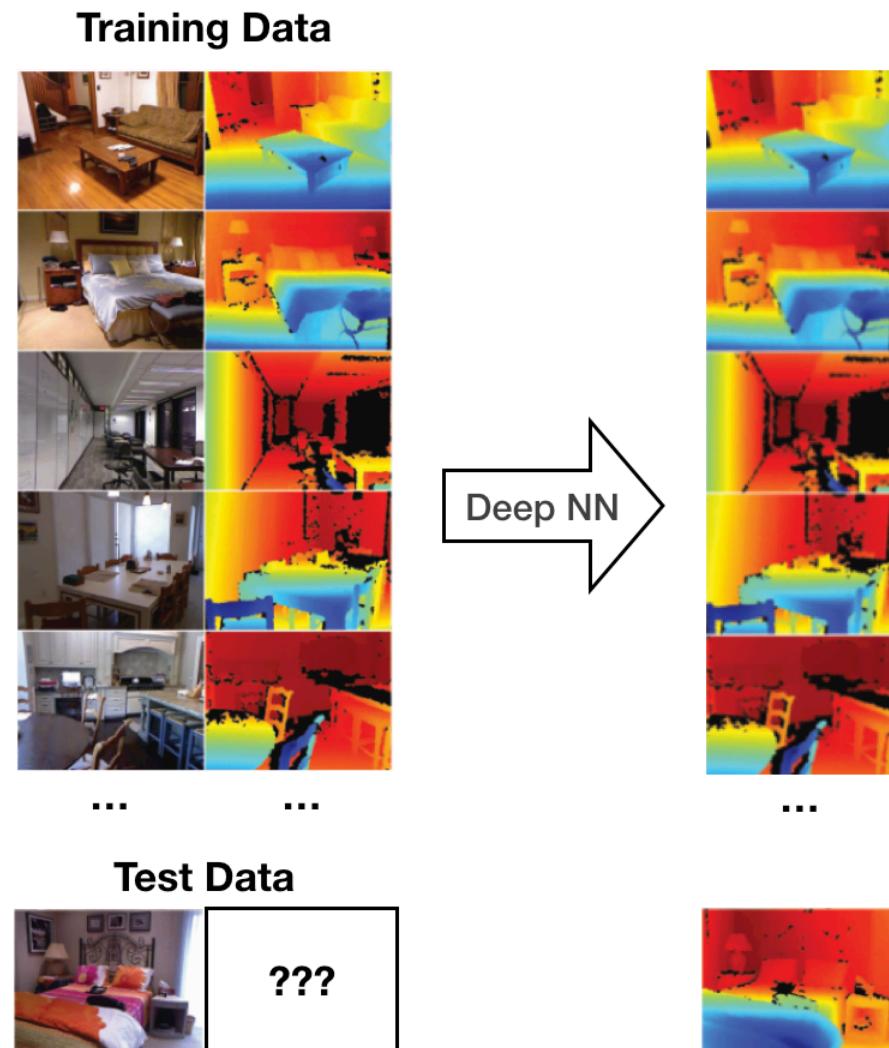
Treat each individual pixel of an input image as a single node in the input layer.

Used to obtain a depth value (non-normalized).



# Training the Deep Neural Network

- Identify complex trends and patterns within its sample data.
- Verify with the desired output.
- Adjust internal weights to produce a better output.



# AR Integration

- Model building in Maya.
- Placed within the scanned environment.
- Depth values allow for scaling while translating.



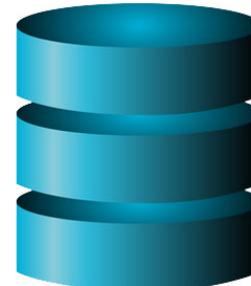
# Maintenance and Management

- Act as a store-front for all current models.
- Used to hold and save all annotator data.
- Allows for any phone with access to app.

Host



Server

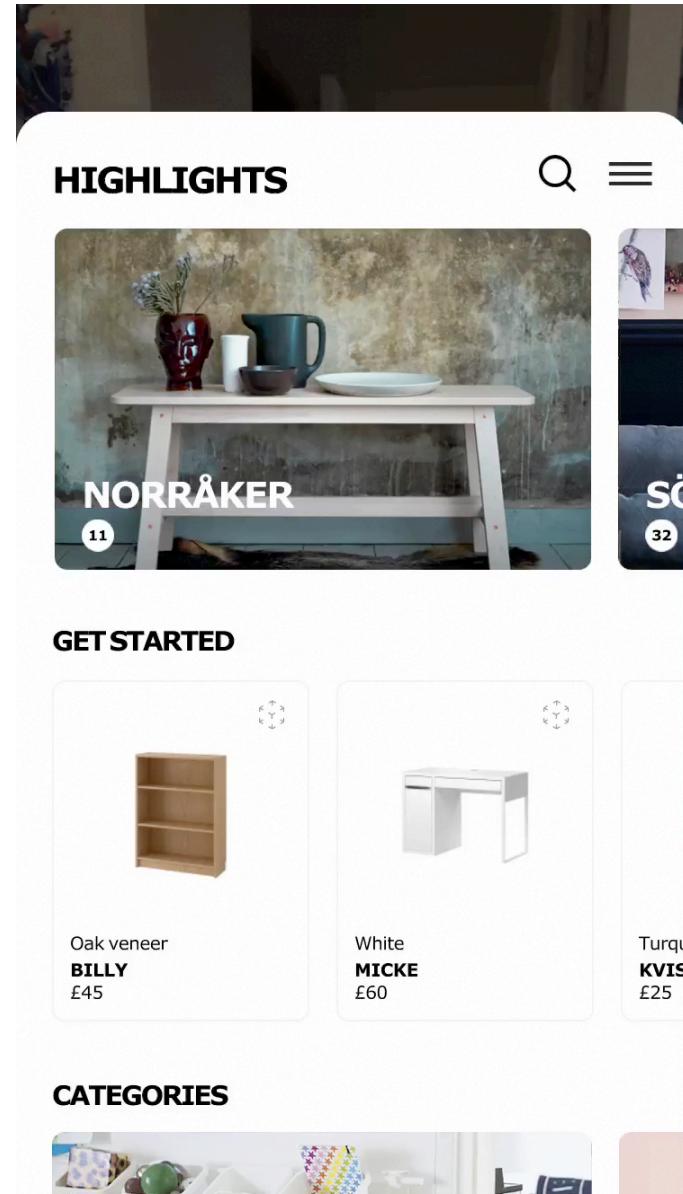


Client



# Case Study: IKEA's Place

- Augmented Reality Furnishing (2017)
- “True-to-scale” 3D models of furniture
- Presents multiple models at once
- Considers Spatial-Optics



# Additional Deliverables

User testing for feedback and what users would like to be able to achieve while using the app.

- Virtual sketcher
- Object likeness
- Multi-system viewing



# Timeline – Phases of Development

**Key:**

End-points

Research

Depth

Model-Placement

Store Maintenance

Unit/Case Testing

Extra Deliverables

Clean-Up

## May

M	T	W	T	F	S	S
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

## June

M	T	W	T	F	S	S
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
1	2	3	4	5	6	7

## July

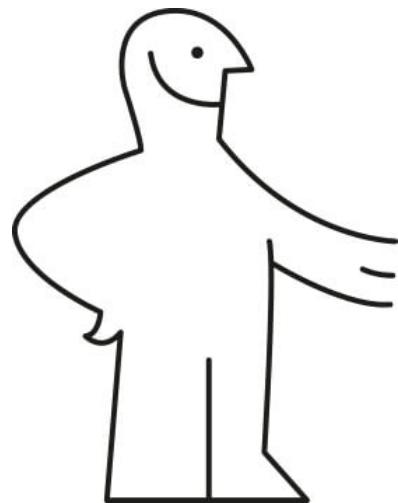
M	T	W	T	F	S	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4
5	6	7	8	9	10	11

## August

M	T	W	T	F	S	S
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8

Thanks for listening!

Q&A



# References (for personal interest)

- IKEA Place, App Store
- Gesture-Based Augmented Reality Annotation,  
University of California
- NYU Depth Dataset
- Design of an annotation system for taking  
notes in virtual reality, HAL archives