Lit Review Papers

09 October 2019 17:04

Paper name	**Key findings**	**Other Interesting bits**
Introduction to Human-Building Interaction (HBI)	Overview of HBI	Predicted as a growing field
Spatial Augmented Reality (book) -Oliver Bimber, Ramesh Raskar	Overview of SAR with methodology	
Combining Shape-Changing Interfaces and Spatial Augmented Reality Enables Extended Object Appearance	Changeable real-world implements with extended accuracy and detail	
Audio Augmented Reality: A Prototype Automated Tour Guide	Enriching tours through technology. Better accessibility	
The House of Olbrich - An Augmented Reality Tour through Architectural History	Usage of SnapshotAR for easier presentation of information	Using cloud computing for CPU intensive algorithms like 3D feature recognition.
Overview of Smartphone Augmented Reality Applications for Tourism	an overview of current smartphone AR applications outlining tourism-related domain-specific design challenges	
Augment-able Reality: Situated Communication through Physical and Digital Spaces	Attaching communication to the physical world through location tags	Exploring easy data transfer between real world and personal device. Leaving
A Tracking Framework for Augmented Reality Tours on Cultural Heritage Sites	More methods for tracking real world environment	
A digital look at physical museum exhibits Designing personalized stories with handheld Augmented Reality in museums	User-tailored museum tours by creating a user profile	
Exploring the Design of Hybrid Interfaces for Augmented Posters in Public Spaces		AR becoming too tiring to use
Stylized Augmented Reality for Improved Immersion	Novel approach for combining real and virtual images. Styling the real world in a "cartoon-like" way, in order to make AR objects fit in	Users find it more immersive than traditional AR
Collaborative Augmented Reality for Outdoor Navigation and Information Browsing.	Augmenting the user's view with location data	
The Westwood Experience: Connecting Story to Locations Via Mixed Reality	A study on the westwood experience, outlining general guidelines for story telling using mixed reality	
Gesture-based interaction via finger tracking for mobile augmented reality	Interaction with an AR application through real-life gestures for improved accuracy and experience	Area in which the user can see when they put the phone close to their eyes Difficulty when interacting with objects mid air Lack of Haptic feedback when using AR
Hands in Space Gesture Interaction with Augmented-Reality Interfaces	Work on preferred gestures when using AR	Participants were choosing their own gestures
Markerless Visual Fingertip Detection for	NEED TO FIND A FREE VERSION	

Natural Mobile Device Interaction		
Real-time Hand Interaction for Augmented Reality on Mobile Phones	Using unencumbered hands for input	Not yet suitable for fine motions. Can use the touch screen for that
Evaluating the Benefits of Real-time Feedback in Mobile Augmented Reality with Hand-held Devices	AR+Feedback augmenting user experience	
REVEL: Tactile Feedback Technology for Augmented Reality	Virtual Tactile feedback through a change in texture	Electrovibration tactile feedback they describe their drawbacks
The Emergence of Augmented Reality (AR) as a Storytelling Medium in Journalism	AR overtaking traditional journalism	
Designing interactive narratives for mobile augmented reality	3 different proposals for building AR storytelling	

Project Description

17 October 2019 08:51

Augmented Reality Tour of the University of Dundee campus.

Research Papers:

- Audio AR
- Exploring the Design of Hybrid Interfaces for Augmented Posters in Public Spaces (AR tiring to use)
- Gesture-based interaction via finger tracking for mobile augmented reality (explore lack of haptic feedback with AR)
- Stylized Augmented Reality for Improved Immersion (black and white for showing old photos?)
- The Westwood Experience: Connecting Story to Locations Via Mixed Reality

Quite a few papers on using AR for museum tours.

- How do their methods relate to a campus AR tour?
- Does anything change outside?
- Safety of use
- Connecting story to a location via Mixed Reality
- Improving the narrative of a tour through technology

How can AR improve the traditional way of doing campus tours

- Stylizing the world to match the old photographs
- Adding audio to certain locations
- Interacting with the world using the unencumbered hand
- Have participants do a regular tour, then compare it with a self-guided AR one?
- Navigation using the camera view?

Usability and Accessibility when using AR for tours

- AR can become tiring. Look at ways to minimise the tiring movements.
- AR gestures are difficult to use for small movements
- Any areas of the campus that are difficult for colour blind people? Maybe have a camera filter for them?
- Lack of Haptic feedback with AR. Any alternatives? (change of colour of the object)

Tour Paths

21 March 2020 11:56

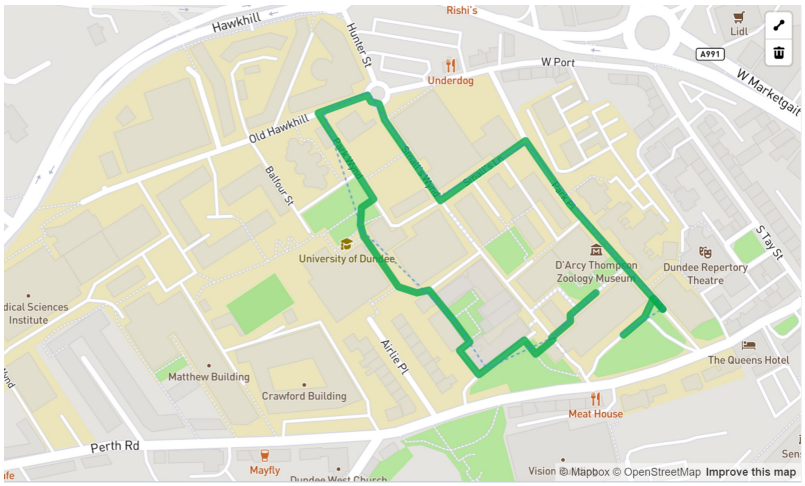
Identified Paths

- Life Sciences
- Physical Sciences
- Formal Sciences
- Social Sciences
- Applied Sciences
- Art and Design

Life Sciences School of Life Sciences School of Medicine School of Dentistry School of Science and Engineering **Subject List:** • Biological and Biomedical sciences • Anatomy and Human Identification • Dentistry • Medicine • Nursing and Health Sciences	**Builldings** • Life Sciences Complex • Carnelly Building • Old Medical School • The Fleming Gym Building (CAHID) • Ewing Building (Leverhulme Research Centre for Forensic Science) • Hawkhill House • Dental Hospital	Path - Life Sciences - Hawkhill House - DUSA - Geddes - Fleming - OMS - Dental Hospital - Ewing Building - ISE - Belmont	-2.9822808401035275,56.45787599453902;-2.984231539064268,56.45726095387295;-2.9852774911600193,56.457904655968946;-2.9846991753853445,56.45872154371898;-2.9818437406506177,56.45920723593272;-2.980466734028056,56.45816176282304;-2.9804197349730828,56.45850560813159;-2.9794654526324393,56.45883448182872;-2.978646842187544,56.45820269252553;-2.979744661811651,56.457653278586406;-2.9793226245759,56.45721514568771;-2.9801493454452554,56.45689418891851;-2.9804593328317424,56.45727463235403;-2.981833104896424,56.457498243141771 

Physical Sciences School of Life Sciences School of Science and Engineering School of Social Sciences **Subject List:** • Biological and Biomedical Sciences • Physics • Geography/Environmental Formal Sciences School of Science and Engineering Subject List: • Computing • Mathematics • Engineering? Applied Sciences Engineering Computing Architecture Environmental Science Medicine Dentistry	Tower Building (Geography) Carnelly Building (Chemistry) Harris Building (Physics) Fultion Building Queen Mother Building	**Path**: Tower Carnelley Fulton Dalhousie Heathfield QMB DUSA Chaplaincy Peters Harris	**-2.9785173697027574,56.45750258629414;-2.977928587511826,56.45774935352;-2.9794523971679894,56.45878337196896;-2.9807117278837723,56.45833135133455;-2.981752837848859,56.45915880562751;-2.9821998068713924,56.45990042673847;-2.9845847550407 71,56.45961034292421;-2.9840662747647855,56.45875139472855;-2.9835574079850744,56.45883810500584;-2.9828873490193075,56.45821275378222;-2.9820329539921886,56.45854825220388;-2.9815907323856266,56.458221923 3057;-2.9819158301185666,56.458061676383664;-2.9809011211587233,56.45756929203887;-2.980152220807014,56.457911396549065;-2.9793434088566357,56.45741105527179;-2.978608277785611,56.45748661144805** 

Social Sciences School of Social Sciences School of Business School of Education and Social Work	Tower Building (School of Social Sciences) Ellenbank & Union Mount (School of Business) Scrymgeour Building (School of Law)	**Path:** Tower OTI Ellenbank Carnegie	-2.978385909005823,56.45756157993688;-2.9790289179727267,56.45719177870993;-2.980039360635459,56.45693074038226;-2.980511775386418,56.45732954821523;-2.9819158970079513,56.45808364612819;-2.982493292815178,56.45906975157891;-2.98182403858425,56.45922926623115;-2.9807479827618977,56.4583591781695;-2.979435719564094,56.458808726156775;-2.978123456366319,56.45788062123984;-2.9773492210790664,56.45743831326138;-2.9779922300459134,56.45722078285797

School of Humanities Subject List • Business • Community Learning and Development • Education • English/Creative Writing/Film Studies • Geography/Environmental Science • History • Law • Philosophy • Politics • Psychology • Social Work	Building (School of Law)	Carnegie Chaplaincy Dalhousie Library Scrymgeour Bonar Hall	372207828379? 

Art and Design	Old Medical School (Listed Building) Scrymgeour Building (Pretty Building) Duncan of Jordanstone College of Art & Design (DJCAD)	**Path:** Life Sciences Hawkhill House DJCAD *Up Airlie Place* Geddes Carnelley Scrymgeour *behind OMS* Library Belmont	-2.985294428222886,56.45786094586231;-2.9844292359325664,56.457444566901785;-2.9831593569259 1,56.45631877871037;-2.980789251100873,56.45651155302858;-2.9818079452492157,56.45736745918597 4;-2.980900888814972,56.45761420332576;-2.9805659756713965,56.457367459185974;-2.980356654955699,56.45744456690184;-2.980133379526251,56.4572595081207;-2.98032874552689,56.45718240002924;-2.9801752436688673,56.45684312256694;-2.979254232520816,56.4572595081207;-2.9786402250901176,56.45766817839257;-2.978054127086949,56.45783010313309;-2.9785844062324145,56.45818479300962;-2.979728692809914,56.45762962478099;-2.980733432243198 4,56.45832358379883;-2.983384827971861,56.45784552450104;-2.9838592882596515,56.45820792484318;-2.9841104731179655,56.45821563545124;-2.98426397497596,56.45870140060032;-2.9852687144092442,56.45852405848828;-2.985282669124274,56.45790720990979 

Building	Number of Paths	Photo Sphere	Portal	Pedestal	Link to implements
- Tower Building	**2**	✓		✓	
- Carnelley Building	**3**			✓	uod_museums
- Old Medical School	1			✓	https://sketchfab.com/tilt
- Old Technical Institute	1			✓	
- Ellenbank & Union Mount	1	✓		✓	
Fleming Building	1	✓			anatomy_dundee
- Geddes Quadrangle	**2**			✓	
- Carnegie Building	1			✓	
Peters Building	1	✓			
Harris Building	1	✓			
- Scrymgeour Building	**2**	✓		✓	
- Ewing Building	1	✓		✓	Video 11:28 - 12:02
- Fulton Building	1	✓		✓	Video 10:19 - 11:28
- Duncan of Jordanstone College of Art & Design	1	✓	✓		
- Hawkhill House	**2**		✓		uod_museums
- Belmont flats & tower	**2**	✓		✓	Video 4:05 - 5:10
- DUSA The Union	**2**	✓		✓	Video 5:10 - 6:27
- The Chaplaincy Centre	**2**	✓			
- Bonar Hall	1	✓			

- **Library and Learning Centre**	**2**	✓			
- **Life Sciences Complex**	**2**	✓			
- Queen Mother Building	1	✓			
- **Dalhousie Building**	**2**	✓			
- Institute of Sport & Exercise (ISE)	1	✓		✓	Video 22:28 - 23:52
- Heathfield Residences	1	✓			
- Dental Hospital	1	✓		✓	Video 18:38 - 19:43 https://dentistry.dundee.ac.uk/illustrious-history

26 Points of Interest
11 Hubs

20 Photo Spheres

Mock GPS commands

26 March 2020 17:17

Bonar Hall	geo fix -2.97713088989258 56.4574928283691
Scrymgeour Building	geo fix -2.97791862487793 56.4579620361328
Tower Building	geo fix -2.97839140892029 56.4572868347168
Carnelley Building	geo fix -2.97865796089172 56.4578437805176
Old Technical Institute	geo fix -2.97904992103577 56.4574127197266
Old Medical School	geo fix -2.97932958602905 56.4576606750488
Dental Hospital	geo fix -2.97951459884644 56.4585456848145
Fleming Building	geo fix -2.97984385490417 56.4574356079102
Ellenbank & Union Mount	geo fix -2.98000597953796 56.4570274353027
Harris Building	geo fix -2.98014616966248 56.457706451416
Ewing Building	geo fix -2.98023748397827 56.458194732666
Geddes Quadrangle	geo fix -2.98037600517273 56.4573249816895
Carnegie Building	geo fix -2.9806444644928 56.4572105407715
Fulton Building	geo fix -2.98073434829712 56.4588088989258
Library and Learning Centre	geo fix -2.9808201789856 56.4581909179688
Peters Building	geo fix -2.98097610473633 56.4574661254883
P The Chaplaincy Centre	geo fix -2.98159289360046 56.4580192565918
DUSA The Union	geo fix -2.98220300674438 56.457633972168
Dalhousie Building	geo fix -2.9822518825531 56.4593467712402
Queen Mother Building	geo fix -2.98276495933533 56.4586372375488
Duncan of Jordanstone College of Art & Design	geo fix -2.98336482048035 56.4565048217773
Heathfield Residences	geo fix -2.98352241516113 56.4592552185059
Belmont flats & tower	geo fix -2.98408150672913 56.4581756591797
Hawkhill House	geo fix -2.98409914970398 56.4572830200195
Institute of Sport & Exercise (ISE)	geo fix -2.98468899726868 56.4587440490723
Life Sciences Complex	geo fix -2.9855432510376 56.4580001831055

geo fix -2.9805545 56.4576985
56.457706451416, -2.98014616966248
56.4574661254883, -2.98097610473633
56.458019256591, -2.98159289360046

56.4572830200195, -2.98409914970398
56.4565048217773, -2.98336482048035
56.4576606750488,-2.97932958602905

56.4573249816895, -2.98037600517273

Social Sciences

Report TODOs

13 April 2020 11:31

- [ ] Video Demonstration
- [x] User Manual
- [ ] Abstract
- [x] Introduction (re-write)
- [x] Lit Review (extend as discussed)
- [ ] Polish off minutes
- [x] Experiment
  - [x] Method ~1 page
  - [x] Results ~2 pages
- [x] Discussion
- [ ] System Appendices
  - [ ] Use Case Diagrams (Journey map instead?)
  - [ ] Requirements Analysis
  - [ ] Class diagrams
  - [x] DB diagrams
  - [ ] Personas
  - [x] Full description of all software used
- [x] System Development Methodology
- [x] LESPI - appendix (as of now)
- [x] Conclusion
- [x] Future Work
- [ ] Acknowledgements
- [ ] Critical Appraisal
- [x] Original Experiment plan
- [x] Transcriptions + tour navigation
- [x] Calculate ARI questionnaire results
- [ ] DOI links for each reference?
- [x] Figure showing the route that each participant took.
- [ ] GitHub Readme
- [ ] Organise a folder containing notes, scans of notebook, meeting minutes and screenshots of Github/Overleaf commit history
- [ ] COVID-19 statement

Sections:

- A.3 - Design Decisions and Alternatives
- A.4 - Acquisition of new Skills
- D - Critical Evaluation
- D.1 - Project Problems
- Abstract
- Conclusion
- Acknowledgments

Requirements gathering - based on
Can use the experiment design section, instead of the requirements design - that's the requirements

Ideal situation paper with 10 plus pages, appendix at the back
Will have a doodlepoll from Mike about the presentation

In terms of comments from Mike - it will be thorough.

Submission Checklist

- Project Report (PDF) - Firstname_Surname.pdf
- Source code
- User Manual
- Minutes of meetings
- Ethics submissions
- Mid-project report
- Project feedback form (on myDundee)
- Scans of the project log book + screenshots of commit history on overleaf/github
- Include the google forms?

(1. Introduction Section) **Introduction:** An explanation of the problem and the objectives of the project. It is very important to give a clear description of what the project is actually intended to do, preferably in non-technical terms.

(2. Lit Review) **Background:** A review of relevant literature and any similar products. The project should be placed in a wider context and this could include the scientific, technical, commercial, social and ethical context. (LESPI Section) Relevant legal, social, ethical and professional issues should be covered here or elsewhere in the report as appropriate.

(4.1 Experiment Section, Method Subsection) **Specification:** A specification of the problem and an explanation of how the student arrived at this specification. (Appendix) An initial work schedule including an overall project plan with time-scales, deliverables and resources. (Appendix, use GItHub) If using agile development, a prioritised product backlog.

(3.1 System Section, Development Methodology Subsection) **Design:** This should include the design method, design process and outcome. Design decisions and trade-offs should be described e.g. when selecting algorithms, data structures and implementation environments or when designing for usability.
Implementation and Testing: A description of production, testing and debugging. A demonstration (or even a proof) that the specification has been satisfied.
Evaluation: Usability should be evaluated with a description of the user-centred design methods employed to produce a usable product, including rapid prototyping, usability methods, results and re-designs as appropriate. Other relevant criteria such as accuracy and computational efficiency should also be employed for evaluation as appropriate. - Just provide an overview of these in the report, then go over in details in appendix?

(Appendix) **[Sprints:** If you are employing agile methods, the three topics above (Design, Implementation and Testing, Evaluation) should be incorporated into each sprint, with evaluation normally being the sprint review.]

(3.2 System Section, System Description Subsection) **Description of the final product**: A clear description of what the final product looks like and what it does. **This is vital but often neglected.**

(?) Appraisal: A critical appraisal of the project indicating the rationale for design/implementation decisions, lessons learnt during the course of the project and an evaluation (with hindsight) of the final product and the process of its production (including a review of the plan and any deviations from it).

(5. Discussion Section) **A description of any research hypothesis**

(6. Conclusion Section) **Summary and Conclusions**

(7. Future Work Section) **Recommendations for future work**

Licensing information

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- https://sketchfab.com/DundeeDental - dentistry models
- https://sketchfab.com/uod_museums - museum models
- https://sketchfab.com/3d-models/3d-architecture-photo-frame-33bedcb0e2064a3a97c19658e254af74 - photo frame
- https://artuk.org/visit/collection/university-of-dundee-duncan-of-jordanstone-college-collection-1446 - Images around the DJCAD gallery (examlpe on how to credit those; https://artuk.org/about/how-to-credit-an-image)
- https://www.behance.net/gallery/70910597/Demiurge-33 - Art & Design Path pic
- https://www.newscientist.com/term/dna/ - Life Sciences Path pic
- https://www.independent.co.uk/voices/mental-health-crisis-world-social-work-day-depression-anxiety-support-community-care-a8264666.html - Social Sciences pic

(unsure)
https://blog.turbosquid.com/royalty-free-license/#Games-Usage (Royalty-free license)
https://www.turbosquid.com/3d-models/free-max-model-architectural-modules/767833 - Pedestal
https://www.turbosquid.com/3d-models/3d-door-1323686 - Door

MIT
https://github.com/robertohuertasm/SQLite4Unity3d - SQLite4Unity3d

Unknown
Google Maps - 360 images - **https://www.google.com/permissions/geoguidelines/**
https://www.youtube.com/watch?v=9DgUAej69rs - Video
Mapbox for Unity and the examples within
Google ARCore and the examples within

- Icons - all from flaticon - https://www.freepikcompany.com/legal#nav-flaticon - guidelines on how to do it: https://support.flaticon.com/hc/en-us/articles/207248209-How-I-must-insert-the-attribution-

Images on Pedestals:
https://blog.dundee.ac.uk/one-dundee/old-halls-of-residence/ - Belmont, DUSA

- https://en.wikipedia.org/wiki/Andrew_Carnegie - Carnegie - Was a CC license

https://www.facebook.com/UniversityofDundee/photos/a.96278472301/10153154634742302/?type=1&theater - Ellenbank & Union mount (Archives)

- Patrick Geddes: Luminary or Prophet of Demonic Planning - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Patrick-Geddes-online-at-wwwpatrickgeddescentreorguk-accessed-29-July-2019_fig1_338066777 [accessed 26 Apr, 2020] - Geddes quadrangle

https://blog.dundee.ac.uk/one-dundee/sports-club-experiences/ - ISE
https://www.dundee.ac.uk/stories/transforming-lives-through-education-social-work - OTI drawing, Scrymgeour (background of title), the college building
https://blog.dundee.ac.uk/one-dundee/a-towering-foundation/ - Tower Building