

# Michael Cooper

## Curriculum Vitae

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Address: 11 Brushwood Grove, Emsworth, PO10 7GJ  
Phone: + 44 (0)7725920302  
Email: [mcooper.engineering@gmail.com](mailto:mcooper.engineering@gmail.com)  
GitHub: [www.github.com/MichaeHCooper/Example-Work/tree/master](https://www.github.com/MichaeHCooper/Example-Work/tree/master)  
Nationality: British

## Academic Interests

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My specialty is within the intersection of Civil Engineering and software. During my BEng in Civil Engineering I became interested in creating software for the construction industry, this has lead me to undertake a MSc in Computer Science to further my software design skills.

Within computer science I am specifically interested in artificial intelligence and it's application to the construction industry, as a consequence I have focused my MSc on AI and reinforcement learning.

## Education

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|--|---|---------------------------------|
| <b>Postgraduate Degree</b>   |   | <b>2018-2019</b>                |
| University of Bath   |   |                                 |
| MSc in Computer Science  | Completion September 2019, Expected Merit/Distinction |                                 |
| <b>Undergraduate Degree</b>  |   | <b>2015-2018</b>                |
| University of Southampton  |   |                                 |
| BEng in Civil Engineering.   | 2:1   |                                 |
| <b>Further Education</b>   |   | <b>2013-2015</b>                |
| Havant & South Downs College   |   |                                 |
| Mathematics A2   | A*  | Chemistry A2                    |
| Physics A2   | A   | Further Mathematics A2          |
| <b>Secondary Education</b>   |   | <b>2008-2013</b>                |
| Warblington School and Fareham College for Diploma in Engineering (Head Boy) |   |                                 |
| 11 GCSEs   | 6 A*s, 1 A, 4 Bs                                      | Level 2 Diploma in Engineering. |

## Career Summary

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| <b>Bath on Ice</b>   |  | <b>2018-2019</b> |
| Bath, UK   |  |                  |
| Worked as an ice-marshall part time over the Christmas period at the temporary rink in Bath.   |  |                  |
| <b>Scott White &amp; Hookins</b>   |  | <b>2016-2017</b> |
| Winchester & Sutton, UK  |  |                  |
| Two summers, totalling 20 weeks interning as a civil and structural engineer within a design office. Projects included working on the structure for the Carolyn House project in Croydon.                  |  |                  |
| <b>Emsworth Slipper Sailing Club</b>   |  | <b>2013-2015</b> |
| Emsworth, UK   |  |                  |
| Regularly teaching sailing to a youth group as a volunteer. This involved a number of other qualifications I have: RYA dinghy Instructor, RYA Powerboat Level 2, RYA Saftey Boat and RYA First Aid at Sea. |  |                  |

# Programming and Software Experience

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|-----------------|------------------|----------------|-------------|------------------|---------------|
| Autocad         | Very Experienced | Taught in BEng | Python      | Very Experienced | Taught in MSc |
| Sketchup        | Very Experienced |                | Java        | Experienced      | Taught in MSc |
| Office Suite    | Very Experienced |                | C           | Experienced      | Taught in MSc |
| Lusas           | Experienced      | Taught in BEng | C#          | Experienced      |               |
| Midas           | Experienced      |                | Haskell     | Experienced      | Taught in MSc |
| Adobe Suite     | Experienced      |                | Keras       | Experienced      | Taught in MSc |
| Git/GitHub      | Experienced      | Taught in MSc  | Tensor Flow | Intermediate     |               |
| Rhino           | Experienced      | Taught in MSc  | SQL         | Intermediate     | Taught in MSc |
| Grashopper      | Experienced      | Taught in MSc  | Matlab      | Basic            |               |
| Indigo Renderer | Experienced      |                | HTML        | Basic            |               |
| LaTeX           | Experienced      |                |             |                  |               |
| Revit           | Intermediate     |                | Windows     | Very Experienced |               |
| Unity           | Intermediate     |                | Android     | Very Experienced |               |
| Solidworks      | Intermediate     |                | Linux       | Experienced      | Taught in MSc |
| Abaqus          | Intermediate     |                | Mac OS      | Intermediate     |               |
| HEC RAS         | Basic            |                |             |                  |               |
| 3ds Max         | Basic            |                |             |                  |               |
| Maya            | Basic            |                |             |                  |               |
| Ansys           | Limited          |                |             |                  |               |

## Personal Interests

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Recently I have taken up figure skating and speed skating. I have competed and performed numerous figure skating routines. I am an avid skier and cyclist! In the past I have done significant amounts of sailing and Judo.

I am also a keen video gamer and have recently started to use this expertise to guide my knowledge as to what makes good software, specifically I am looking to build professional software using similar methods to the video games industry.

I enjoy politics and am currently an active member of the Liberal Democrat party in the UK.

## Key Projects

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### Moving Shape Grammars to Full Building Design

2019-Present

MSc Dissertation

My MSc dissertation shall aim to push shape grammars, for example CGA used in ESRI City Engine, towards complete design of buildings. This will firstly involve translating the non-linear design process into something easily performed by computers, then creating a demonstration program. The demo program is intended to be capable of designing a building in it's entirety including every component, from beams to plumbing to facades.

### Neural Network to help automate structural design

2017-2018

BEng Dissertation

My research used a convolutional neural network (CNN) to decompose arbitrary floorplans into rectangles. I did this to move further towards automated structural design; previously this had only been achieved on rectangular or rectilinear structures. My research now provides a method using CNN's which allows for a much wider range of structures to be automatically designed, by simplifying arbitrary floorplans into a set of rectangular segments.

### Final Year Design Project

2018

University

Group project with 5 team members to design a full sized observation tower in Southampton. We designed a 200m tall post-tensioned concrete tower with an observation deck cantilevered at 140m high. The observation deck consisted of a 48m diameter steel ring that was clamped by post-tension cables on one side. I was responsible for the initial architectural design, the observation deck structural design and most of the CAD drawing.

### Carolyn House

2017

Scott White & Hookins

As part of a small team of engineers I contributed to the structural design of the Carolyn house project in Croydon. Specifically I worked on designing and checking the shear walls and steel work using FEA.