

# STUART BURRELL

Carnegie Scholar ◊ University of St Andrews ◊ United Kingdom

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**Languages** English, Basic German, Basic Japanese  
**Programming** Python, R, Git/GitHub, GAP, Unix, LaTeX, Maple.

## EDUCATION

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**PhD, Mathematics**, *University of St Andrews* October 2017 - Present  
Fractal geometry, dynamical systems and dimension theory.  
**Scottish Mathematical Sciences Training Center**,  
Graduate courses in Algebra, Analysis, Topology, Probability and Statistics 2016 - 2018  
**Academy for PhD Training in Statistics**,  
Graduate courses in Statistics at the Universities of Cambridge, Durham and Glasgow. 2016 - 2017  
**Machine Learning Engineer Nanodegree**, *Udacity* 2016 - 2017  
**MMath, Mathematics**, First Class Honours (93%/GPA 4.0), *University of St Andrews* 2012 - 2016

## PUBLICATIONS

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**The dimensions of inhomogeneous self-affine sets (with J.M. Fraser)**, arXiv July 2018  
*submitted*.  
**On the dimension and measure of inhomogeneous attractors**, arXiv May 2018  
*Real Analysis Exchange* (to appear).

## SOFTWARE CONTRIBUTIONS

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**GAP Semigroups package** 2016  
Methods to decide the order and torsion problems of natural and tropical matrix semigroups.  
**GAP Digraphs package** 2016  
Methods for computing the simple circuits of a digraph.

## EXPERIENCE

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**Research in Statistical Ecology and Machine Learning** 2016-2017  
*Centre for Research into Ecological and Environmental Modelling*, St Andrews.  
**GAP Software Development** Summer 2016  
*School of Mathematics and Statistics, University of St Andrews*, St Andrews.  
**Laidlaw Internship in Research and Leadership** Summer 2015  
*School of Mathematics and Statistics, University of St Andrews*, St Andrews.  
**Undergraduate Research Summer School** Summer 2014  
*School of Mathematics and Statistics, University of St Andrews*, St Andrews.

## AWARDS AND SCHOLARSHIPS

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**Poster Award**, *Fractals and Stochastics 6* October 2018  
**Carnegie PhD Scholarship** 2016-2020  
**Duncan Prize**, *University of St Andrews* 2016  
**Sanderson Prize**, *University of St Andrews* 2016  
**The Arthur Hinton Read Memorial Prize**, *University of St Andrews* 2016  
**ODSC Machine Learning/Deep Learning Scholarship** 2016  
**IMA Graduate Prize Winner**, *Institute of Mathematics* 2016  
**Graduate Medal in Mathematics**, *University of St Andrews* 2016

<b>The Principal's Scholarship for Academic Excellence, <i>University of St Andrews</i></b>	2012-16
<b>The University Scholarship for Research and Leadership, <i>University of St Andrews</i></b>	2015
<b>The Deans' List for Academic Excellence, <i>University of St Andrews</i></b>	2012-16
<b>Gold Duke of Edinburgh Award</b>	2013

## TALKS

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<b>Dimension drop and inhomogeneous self-affine sets</b> <i>Pure Analysis Seminar, St Andrews.</i>	October 2018
<b>The dimensions of inhomogeneous self-affine sets (poster presentation)</b> <i>Fractals and Stochastics VI, Bad Herrenalb, Germany.</i>	October 2018
<b>A brief note on the dimension of inhomogeneous attractors</b> <i>Dynamic Days Europe, Loughborough.</i>	September 2018
<b>A universal upper bound on the dimension of inhomogeneous attractors</b> <i>British Mathematical Colloquium, St Andrews.</i>	June 2018
<b>How big are inhomogeneous attractors?</b> <i>Edinburgh Mathematical Society PG Student Meeting, The Burn, Glen Esk</i>	May 2018
<b>On the dimension and measure of inhomogeneous attractors</b> <i>Pure Analysis Seminar, St Andrews.</i>	April 2018
<b>An introduction to inhomogeneous attractors</b> <i>Pure Postgraduate Seminar, St Andrews.</i>	April 2018
<b>An introduction to iterated function systems</b> <i>Postgraduate Interdisciplinary Mathematical Symposium, Glen Esk</i>	February 2018
<b>Dimension of inhomogeneous self-conformal and self-affine sets</b> <i>School Research Day, St Andrews.</i>	January 2018
<b>Inhomogeneous attractors and upper box dimension</b> <i>Insitut Mittag-Leffer, Stockholm, Sweden.</i>	December 2017
<b>Trace contrast methods in acoustic space</b> <i>African Institute of Mathematical Sciences, Cape Town, South Africa.</i>	January 2017
<b>An introduction to trace contrast methods</b> <i>University of Cape Town, Cape Town, South Africa.</i>	January 2017
<b>Sequential Monte Carlo in population dynamics</b> <i>School of Mathematics and Statistics, St Andrews.</i>	April 2016
<b>Artificial intelligence and Gödel's incompleteness theorems</b> <i>School of Mathematics and Statistics, St Andrews.</i>	February 2015

## OUTREACH

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<b>The journey to a PhD in Mathematics</b> <i>UWS Summer STEM Academy, Glasgow.</i>	July 2018
<b>Fractal geometry in nature and art</b> <i>The Royal Society of Edinburgh, Edinburgh.</i>	February 2018

## CONFERENCES

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<b>Fractal Geometry and Stochastics VI</b> <i>Evangelische Akademie Baden, Bad Herrenalb, Germany</i>	October 2018
<b>CMI at 20</b> <i>Clay Mathematics Institute, Oxford.</i>	September 2018
<b>Dynamic Days Europe</b> <i>University of Loughborough, Loughborough.</i>	September 2018
<b>Thermodynamic Formalism in Dynamical Systems</b> <i>International Centre for Mathematical Sciences, Edinburgh.</i>	June 2018
<b>British Mathematical Colloquium</b> <i>University of St Andrews, St Andrews.</i>	June 2018

## TEACHING

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All available student feedback data is included and reported on a scale of 1 (excellent) to 5 (poor) in the categories of Explanation (E), Organisation (O) and Availability (A).

<b>Mathematics and Statistics Tutor</b> , <i>CAPOD, University of St Andrews</i> ,	2016 - Present
<b>MT2502 Analysis</b> , <i>Tutor, University of St Andrews</i>	Autumn 2018
E = 1.09, O = 1.33, A = 1.0	
<b>MT2000 Python</b> , <i>Demonstrator, University of St Andrews</i>	Autumn 2018
<b>Math Base</b> , <i>Tutor, University of St Andrews</i>	Autumn 2018
<b>MT1002 Mathematics</b> , <i>Demonstrator, University of St Andrews</i>	Spring 2018
<b>MT1002 Mathematics</b> , <i>Tutor/Demonstrator, University of St Andrews</i>	Autumn 2017
E = 1.62, O = 1.65, A = 1.17	
<b>MT1003 Pure and Applied Mathematics</b> , <i>Tutor (temporary), University of St Andrews</i>	Spring 2017
<b>MT2508 Statistical Inference</b> , <i>Demonstrator, University of St Andrews</i>	Spring 2017
<b>MT2504 Combinatorics and Probability</b> , <i>Tutor/Demonstrator, University of St Andrews</i>	Autumn 2016
E = 1.17, O = 1.15, A = 1.17	
<b>MT2000 Introduction to Python</b> , <i>Demonstrator, University of St Andrews</i>	Autumn 2016

## WORKSHOPS

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<b>Postgraduate Interdisciplinary Writing Workshop</b>	August 2018
<i>University of St Andrews, The Burn, Glen Esk.</i>	
<b>Summer School in Dynamics (Introductory and Advanced)</b>	July 2018
<i>International Centre for Theoretical Physics, Trieste, Italy.</i>	
<b>Postgraduate Interdisciplinary Mathematical Symposium</b>	January 2018
<i>University of St Andrews, The Burn, Glen Esk.</i>	
<b>Statistical Methods in Gibbon Conservation</b>	August 2017
<i>Centre for Research into Ecological and Environmental Modelling, St Andrews.</i>	
<b>Estimating Animal Abundance and Density using Acoustic Data</b>	January 2017
<i>University of Cape Town, Cape Town, South Africa.</i>	
<b>Scottish Mathematical Craining Center Symposium</b>	October 2016
Perth.	
<b>CoDiMa software carpentry</b>	October 2016
<i>International Centre for Mathematical Sciences, Edinburgh.</i>	
<b>Advanced PAMGuard</b>	October 2016
<i>PAMTech, Edinburgh.</i>	
<b>Spatial Capture-Recapture Methods</b>	August 2016
<i>Centre for Research into Ecological and Environmental Modelling, St Andrews.</i>	
<b>Laidlaw Leadership Program</b>	2015
<i>endorsed by the Institute of Management, St Andrews.</i>	

## PROFESSIONAL RESPONSIBILITIES

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<b>Carnegie Trust Scholars Network</b> , <i>Event organiser</i>	2019 - Present
<b>Postgraduate Interdisciplinary Mathematical Symposium</b> , <i>Organiser</i>	2018 - 2019
<b>Scottish Mathematical Sciences Training Centre Council</b> , <i>Student Representative</i>	2016 - 2017