Department	School of Computing
Supervisors	Peter Chapman
Project Title	Genetic Programming for Diagram Generation

PROJECT DESCRIPTION

Euler Diagrams are known to be an effective method of representing set-based data. Drawing effective Euler diagrams is difficult, with many proposed drawing algorithms creating either cluttered diagrams, or breaking other guidelines which are known to aid readability. The intended user of the diagram is only included in the evaluation stage, if at all, and is not included in the design stage of the algorithm. In this project, we seek to include the user in the design of the algorithm, by harnessing the power of genetic programming. Much like evolutionary art can be guided by the choices of a user, so the final aesthetic of a diagram can be guided through preferences users make. The challenge of this project is to ensure that any output correctly represents the underlying set-based information, and also produces output which is visually appealing to the user.

Prospective applicants are encouraged to contact the Supervisor before submitting their applications. Applications should make it clear the project you are applying for and the name of the supervisor(s).

Academic qualifications

A first degree (at least a 2.1) ideally in Computer Science or a closely related discipline, with a good fundamental knowledge of programming, set theory and basic statistical methods.

English language requirement

IELTS score must be at least 6.5 (with not less than 6.0 in each of the four components). Other, equivalent qualifications will be accepted. Full details of the University's policy are available online.

Essential attributes:
- Experience of fundamental computer science, with strong programming skills.
- Competent in set theory, logic and discrete mathematics.
- Knowledge of statistical methods.
- Good written and oral communication skills
- Strong motivation, with evidence of independent research skills relevant to the project
- Good time management

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Indicative Bibliography	*Visualization Analysis and Design*. T. Munzner, CRC Press, 2014 *The Art of Artificial Evolution: A Handbook on Evolutionary Art and Music*. Romero and Machado (eds), Springer, 2007 *Visualizing sets: An Empirical Comparison of Diagram Types*. Chapman *et. al.*, Diagrams 2014, Springer, 2014.
Enquiries	For informal enquiries about this PhD project, please contact Peter Chapman (p.chapman@napier.ac.uk)
Web page	https://www.napier.ac.uk/research-and-innovation/research-degrees/application-process