NATASHA DIEDEREN

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EDUCATION

University of Warwick, UK   *October 2020 - Present*
3rd Year, Mathematics BSc   Provisional First: 87% average
Department of Mathematics

Sevenoaks School, UK   *2018-2020*
International Baccalaureate Diploma Programme   Overall score: 44
Higher level subjects: Mathematics, Physics, Chemistry   Scores: 7 7 7
Extended Essay in Mathematics   Grade: A

EXPERIENCE

Undergraduate Research Support Scheme   Coventry, UK
University of Warwick   *June 2022-Present*

· Ten week funded research project over the summer of 2022 focusing on minimal surfaces and mean curvature flow under the mentorship of Felix Schulze.
· First aim is to write up a comprhensive proof of Berstein's problem for minimal surfaces, including an introduction to geometric measure theory.
· Second aim is to do a small project on mean curvature flow, interested in self similar mean curvature flow.

London Mathematical Society Summer School   Edinburgh, UK
Maxwell Institute   *August 2022*

· One of 50 undergraduate students selected to attend a two week programme introducing a variety of topics in modern mathematics.
· Consisted of six mini-courses on optimal transport, Stein's method, quantum algebras, inhomogeneous wave equation, mapping class groups, and binary quadratic forms.

Second Year Essay   Coventry, UK
University of Warwick   *October 2021-April 2022*

· 15 page essay submitted as coursework for degree, recieved overall mark of 91% for essay and oral presentation.
· Topic: Curvature estimation on triangle meshes using a generalisation of the second fundamental form.

Summer Geometry Institute   Remote
Massachusetts Institute of Technology   *July 2021-August 2021*

· One of 34 fellows chosen from over 600 applicants for a six week paid research programme in the field of geometry processing, organised by Justin Solomon, associate professor at MIT.
· Consisted of one week of tutorials introducing geometry processing and five weeks of research projects undertaken in small groups.
· Developed a fluid simulation algorithm that ran over triangle meshes.
· Built a user interface that used the properties of active bending to create elastic strips that would deform to the shape of a given spline.
· Generated and rendered Eulerian minimal surfaces in Houdini.
· Started to develop an algorithm to generate triply-periodic non-manifold minimal surfaces.

Extended Essay in Mathematics
Sevenoaks School

Sevenoaks, UK
October 2019-November 2019

- A 4000 word, self-directed research essay submitted as part of International Baccalaureate Diploma, receiving the highest grade of an A.
- Research question: Under what conditions is the triangle formed by the Euler line of a triangle maximised? Under what conditions is in minimised?

Research Essay in Mathematics
Sevenoaks School

Sevenoaks, UK
April 2019-September 2019

- Written as a precursor to the final extended essay (see above) submitted to the International Baccalaureate Organisation.
- Research question: How can the Euler line of a triangle be generalised to quadrilaterals?
- Involved extending the Euler line to quadrilaterals using both an analytic and a geometric method, proving that these two methods yielded the same line.

HONOURS AND AWARDS

The George France Mathematics Faculty Prize *June 2020*
The Science Merit Prize
Both prizes awarded on graduation from Sevenoaks School.

The Duke of Edinburgh's Award (Gold level) *March 2020*

The Mathematics Faculty Prize *June 2019*
The Science Faculty Prize
Both prizes awarded upon completion of first year of the International Baccalaureate at Sevenoaks School.

Academic Scholarship to Sevenoaks School *December 2017*
Received an offer to study at Sevenoaks School as an academic scholar from August 2018 – June 2020.

SKILLS

Mathematics
Differential geometry, geometric measure theory, real analysis

Programming
Java, Python, MATLAB

Languages
English (fluent), Mandarin Chinese (CEFR B2+), Dutch (proficient)

VOLUNTEERING

Summer Geometry Initiative
Massachusetts Institute of Technology

Remote
October 2018 - February 2020

Was a student volunteer for the tutorial week of the Summer Geometry Institute. Helped students to complete exercises relating to geometry processing.

Outreach Box Programme
Sevenoaks School

Sevenoaks, UK
October 2018 - February 2020

Played a key leadership and organisational role in expanding the Sevenoaks School Outreach Programme. This programme provided state schools in the local area with free scientific equipment to facilitate learning, including microscopes, biological models, cameras, Arduinos, and other resources.

Catalogued all equipment and updated project website, organised the logistics of distributing boxes, and designed foam packaging to protect equipment during transportation.