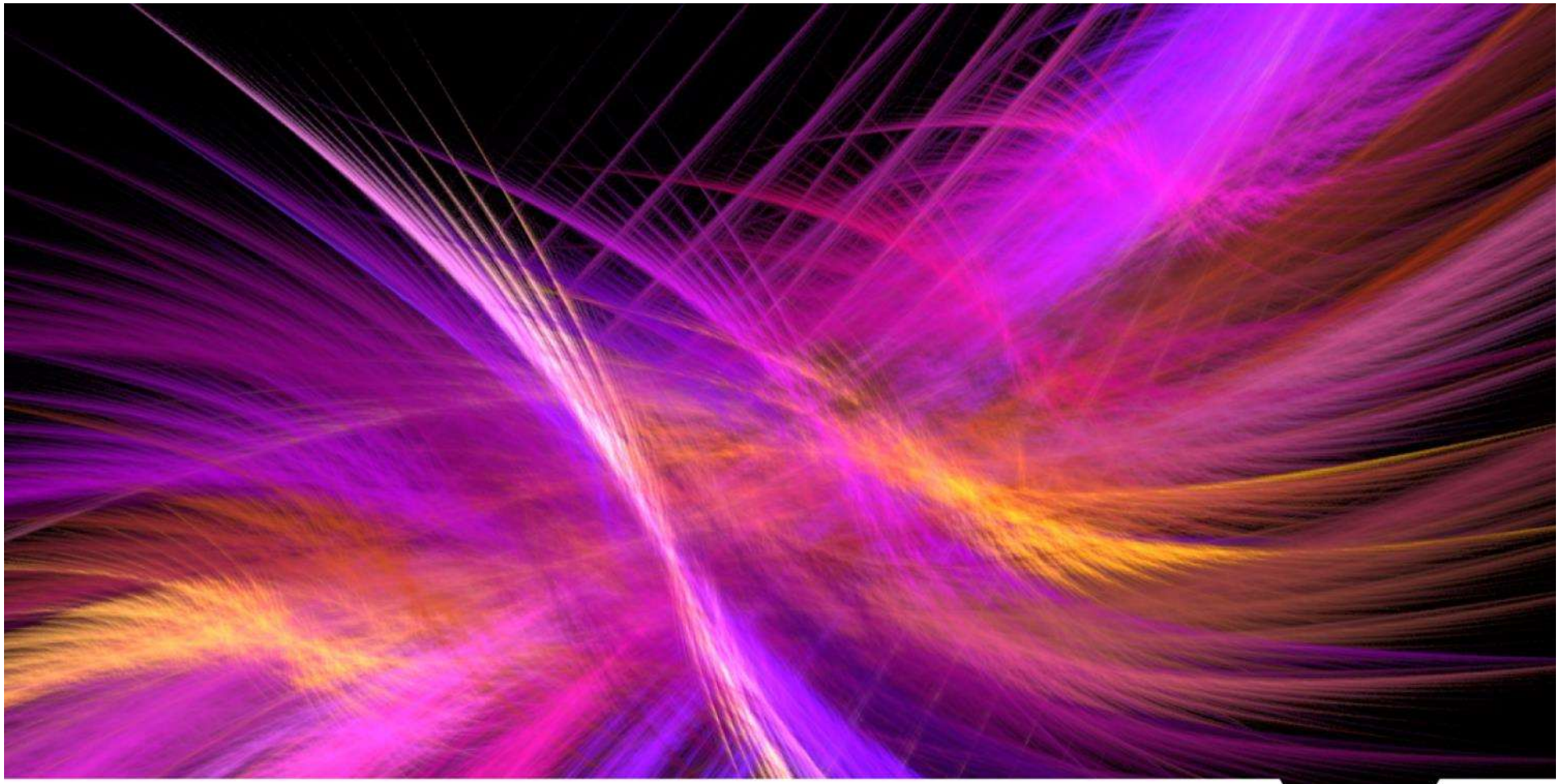


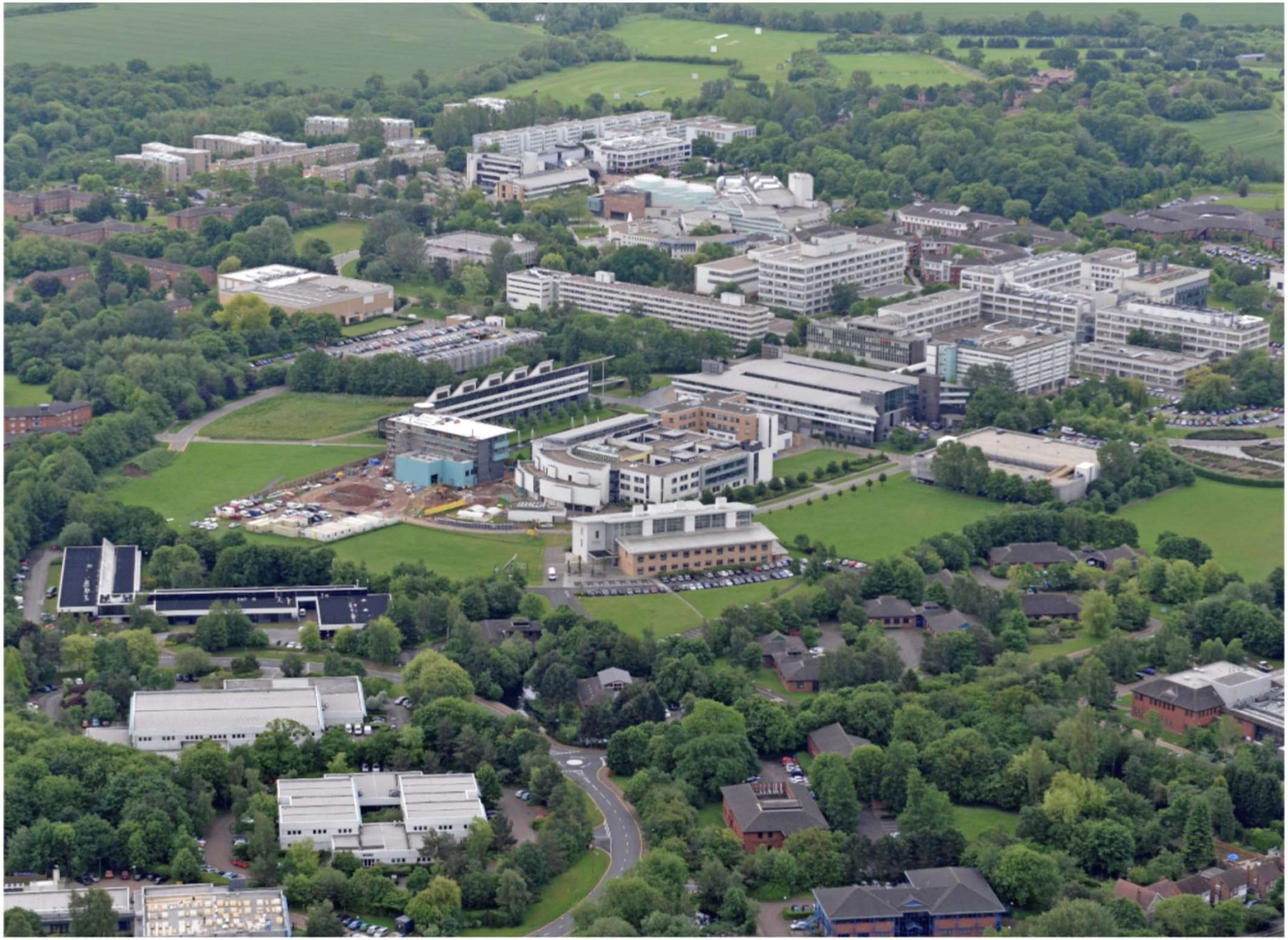
WARWICK
THE UNIVERSITY OF WARWICK

Scholarships at The University of Warwick

Nadia Golenischeva, Regional Representative, The University of Warwick

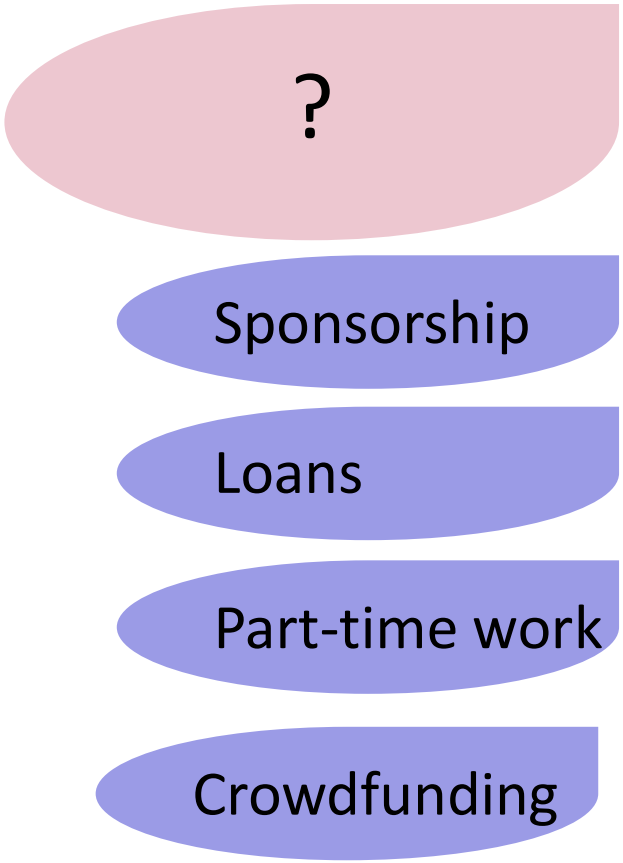
Key Facts: The University of Warwick

- Being founded in 1965 Warwick is one of only three Universities to remain consistently in the top 10 UK rankings for the past ten years
- 7th in The Times and The Sunday Times League Tables 2017
- 7th in Research Excellence Framework
- 87% World leading or internationally excellent research



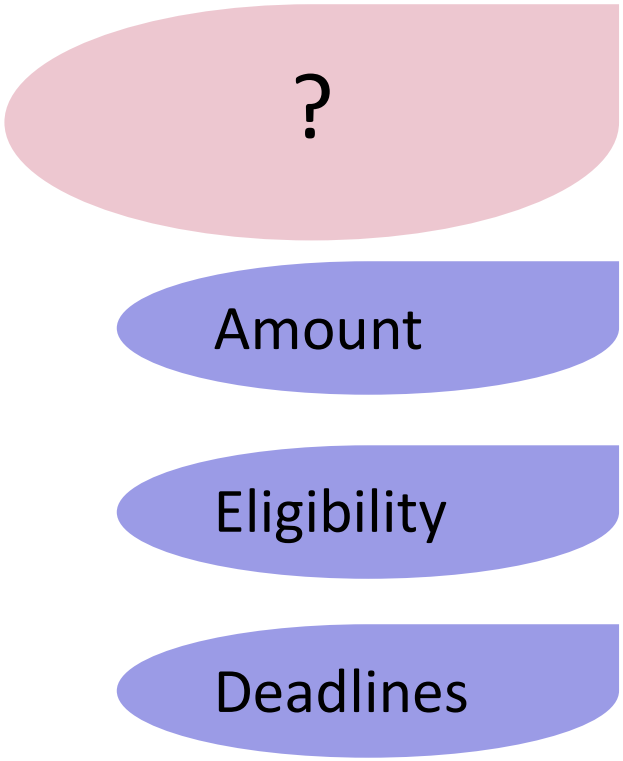
Funding Overview by Source

- External scholarships
  - International funds or Government scholarships – Chevening
  - In country schemes – "Global Education"
- University's scholarships
  - Chancellor's scholarship
  - Departmental scholarships / bursaries
  - Research projects



Funding Overview by Level

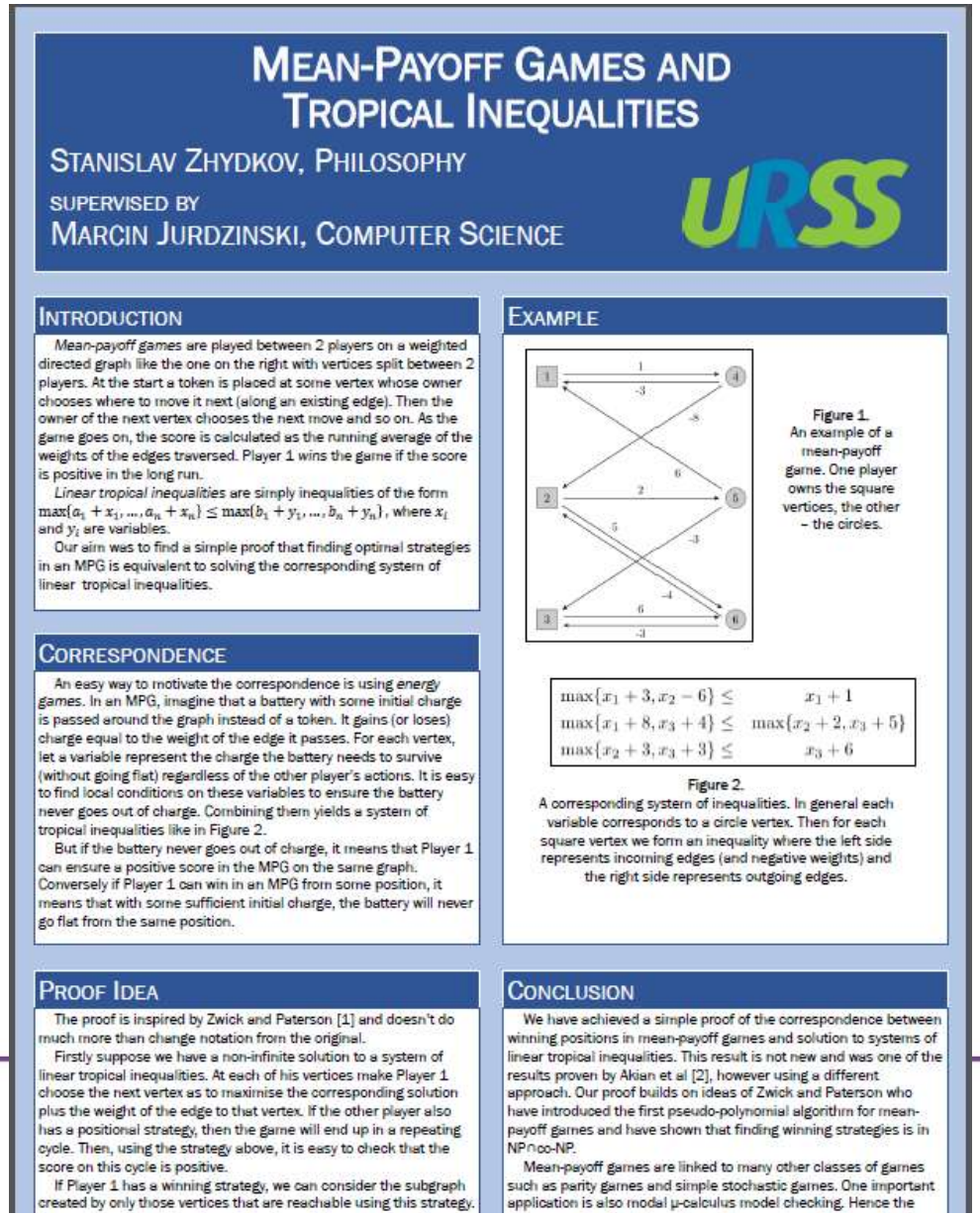
- Undergraduate – bachelors level
  - Bursaries for those who interested in sports, music, research, minority specific, etc.
- Postgraduate taught – masters level
  - Tuition fee reduction predominately
  - Based on academic excellence
- Postgraduate research – PhD level
  - Academic excellence and research experience is a key



Tuition fees in the UK

- Fees vary according to course and university. At Warwick University in 2017/18
  - Bachelor degrees £17’460 to £22’260
  - Master degrees £18’380 to £33’500
  - PhD degrees £16’230 to £20’730
- Living costs:
  - £12000 pa. outside London,
  - £16000 pa. in London

Undergraduate bursary example



Mean-Payoff Games and Tropical Inequalities

Stanislav Zhydkov, Philosophy
supervised by
Marcin Jurdzinski, Computer Science

URSS

Introduction

Mean-payoff games are played between 2 players on a weighted directed graph like the one on the right with vertices split between 2 players. At the start a token is placed at some vertex whose owner chooses where to move it next (along an existing edge). Then the owner of the next vertex chooses the next move and so on. As the game goes on, the score is calculated as the running average of the weights of the edges traversed. Player 1 wins the game if the score is positive in the long run.

Linear tropical inequalities are simply inequalities of the form $\max\{a_1 + x_1, \dots, a_n + x_n\} \leq \max\{b_1 + y_1, \dots, b_n + y_n\}$, where x_i and y_i are variables.

Our aim was to find a simple proof that finding optimal strategies in an MPG is equivalent to solving the corresponding system of linear tropical inequalities.

Correspondence

An easy way to motivate the correspondence is using *energy games*. In an MPG, imagine that a battery with some initial charge is passed around the graph instead of a token. It gains (or loses) charge equal to the weight of the edge it passes. For each vertex, let a variable represent the charge the battery needs to survive (without going flat) regardless of the other player's actions. It is easy to find local conditions on these variables to ensure the battery never goes out of charge. Combining them yields a system of tropical inequalities like in Figure 2.

But if the battery never goes out of charge, it means that Player 1 can ensure a positive score in the MPG on the same graph. Conversely if Player 1 can win in an MPG from some position, it means that with some sufficient initial charge, the battery will never go flat from the same position.

Example

Figure 1.
An example of a mean-payoff game. One player owns the square vertices, the other – the circles.

$$\begin{aligned} \max\{x_1 + 3, x_2 - 6\} &\leq x_1 + 1 \\ \max\{x_1 + 8, x_3 + 4\} &\leq \max\{x_2 + 2, x_3 + 5\} \\ \max\{x_2 + 3, x_3 + 3\} &\leq x_3 + 6 \end{aligned}$$

Figure 2.
A corresponding system of inequalities. In general each variable corresponds to a circle vertex. Then for each square vertex we form an inequality where the left side represents incoming edges (and negative weights) and the right side represents outgoing edges.

Proof Idea

The proof is inspired by Zwick and Paterson [1] and doesn't do much more than change notation from the original.

Firstly suppose we have a non-infinite solution to a system of linear tropical inequalities. At each of his vertices make Player 1 choose the next vertex as to maximise the corresponding solution plus the weight of the edge to that vertex. If the other player also has a positional strategy, then the game will end up in a repeating cycle. Then, using the strategy above, it is easy to check that the score on this cycle is positive.

If Player 1 has a winning strategy, we can consider the subgraph created by only those vertices that are reachable using this strategy.

Conclusion

We have achieved a simple proof of the correspondence between winning positions in mean-payoff games and solution to systems of linear tropical inequalities. This result is not new and was one of the results proven by Akian et al [2], however using a different approach. Our proof builds on ideas of Zwick and Paterson who have introduced the first pseudo-polynomial algorithm for mean-payoff games and have shown that finding winning strategies is in NP∩co-NP.

Mean-payoff games are linked to many other classes of games such as parity games and simple stochastic games. One important application is also modal μ-calculus model checking. Hence the

Undergraduate Research Support Scheme

- A scheme to provide a bursary and skills development training to support undergraduate students who wish to carry out a summer research project as an addition to a degree course.
- Up to £1500

Postgraduate taught scholarships (1)

Department/degree. 2017	Amount	Places	How to apply
Center for Applied Linguistics: MSc Intercultural Communication for Business and the Professions	50% off tuition fees	1 place	Application statement from unconditional offer holder. Deadline: 31 July
Warwick Business School: All MSc and MBA degrees	25% - 50% off tuition fees	N/a	All offer holders are considered. No deadline
Chemistry: all MSc degrees	£4,000 off tuition fees	N/a	All offer holders are considered. No deadline
Computer Science: all MSc degrees	3x awards: 1x £5,000 and 2x £2,500 off tuition fees		All offer holders are considered. No deadline
School of Engineering: all MSc degrees	2x £10,000; 3x £7,500; 4x £5,000 off tuition fees		Short application form from offer holder. Deadline: 28 April

Postgraduate taught scholarships (2)

Department/degree. 2017	Amount	Places	How to apply
English and Comparative Literary Studies: All MA degrees	4x £4,000 off tuition fees		Short application from offer holder. Deadline: 24 April
History: All MA degrees	Fee bursary of £7,780 plus a maintenance stipend of £10,000	N/a	All offer holders are considered. Deadlines: 18 January and 24 March
History: MA in the History of Medicine	Fee bursary of £7,780	1 place	Application from offer holder. Deadline: 18 January
School of Law: All LLM degrees	Full fee scholarships	2-3 places	Application statement from offer holder. Deadline: 31 March
School of Life Sciences: All MSc degrees	50% off tuition fees	Up to 5 places	Application statement from offer holder. Deadlines: 13 February and 30 May

Postgraduate taught scholarships (3)

Department/degree. 2017	Amount	Places	How to apply
Philosopy: All MA degrees	5x £5,000 off tuition fees		Course application before deadline. Deadline: 17 February
Politics and International Studies: All MA degrees	4x £10,000 off tuition fees		Application from offer holder. Deadline**:** 28 April
Sociology: All MA degrees	5x £5,000 off tuition fees		Application from offer holder. Deadline**:** 28 April
Statistics: All MSc degree	Fee bursary of £8,170 and a maintenance grant of £9,000	2 places	Submit 'bursary application' with course application. Deadline: 30 March
Warwick Manufacturing Group: All MSc degrees	25% - 50% off tuition fees	Up to 50 places	All offer holders are considered. Deadline**:** 20 May

Postgraduate Research Funding

- Chancellor's International Scholarships:
  - PhD candidates
  - Up to 25 places
  - Full tuition fees and a maintenance stipend of £14,539
  - Length of funding: 3.5 years
  - Deadline 18 January 2017 for 2017/2018 intake

- Departmental PhD funding
  - Warwick Business School
  - Center for Caribbean Studies
  - Classics and Ancient History
  - Computer Science
  - Institute for Employment Research
  - School of Engineering
  - History of Art
  - School of Life Sciences
  - Mathematics
  - Politics and International Studies (PAIS)
  - Statistics
  - Warwick Manufacturing Group

Bursary MSc ICBF selection process

1. Applicants **submit a cover letter for the bursary** explaining why they are a suitable candidate.

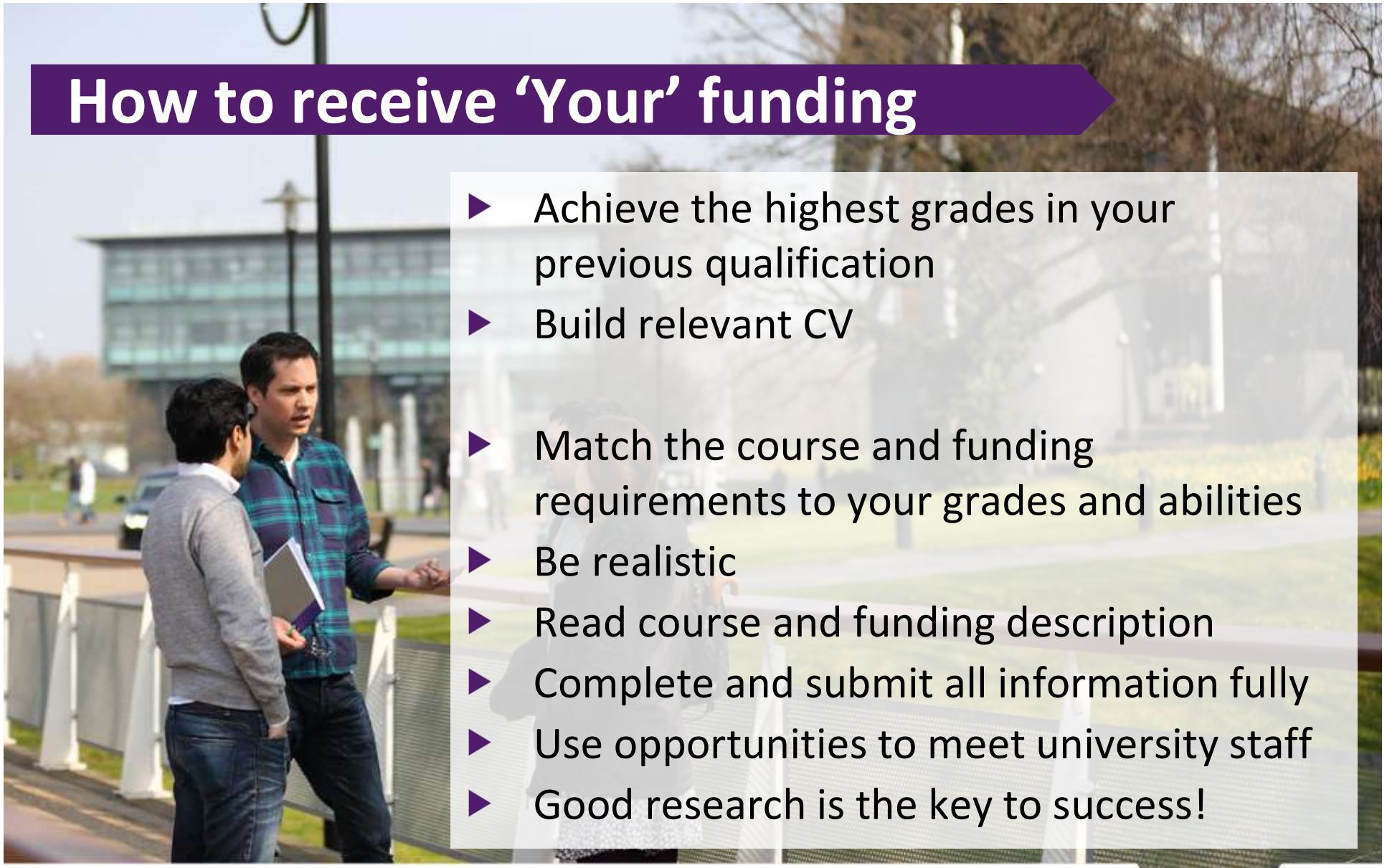
2. For the selection process, **we also consider their application documents**

3. Only **students who accepted the offer** are eligible.

4. **Two people review all applications** on the basis of (a) **academic achievements** and (b) **reasons for taking the course**. In addition **other relevant information** offered is taken into account, e.g. work experience, including volunteer work.

5. Based on the scores we give, **3 candidates will be shortlisted**.

6. The reviewers **meet and talk through the shortlisted candidates** and decide on the successful candidate.



How to receive ‘Your’ funding

- Achieve the highest grades in your previous qualification
- Build relevant CV

- Match the course and funding requirements to your grades and abilities
- Be realistic
- Read course and funding description
- Complete and submit all information fully
- Use opportunities to meet university staff
- Good research is the key to success!

Regional Representative

- Based in St Petersburg, available by email, phone, Whatsapp, Skype
- Pre-application advice
- Application and post-application support
- Eligible to attest supporting documents for Admissions – notary attested copies can be posted to St Petersburg or passed in person
- Visa advice and checks – application, financial evidences, etc
- Free service for Warwick applicants

n.golenischeva@warwick.ac.uk

n.golenischeva@warwick.ac.ru

+7 921 995 9584

191023, РФ, Санкт-Петербург, ул. Инженерная 6, ОШБ, 1 этаж.

WARWICK
THE UNIVERSITY OF WARWICK

For further information, please contact

EURUSCA@warwick.ac.uk
or
N.Golenischeva@warwick.ac.uk