**Competition notice**

Project title: The tragedy of the commons in dynamic context - modelling, methodology and prevention

Principal Investigator: dr hab. Agnieszka Wiszniewska-Matyszkiel

Project description : The topic of the project is dynamic games – multistage and differential – related to "the tragedy of the commons", i.e. the problems in which there are many decision makers (players), each player tending to dynamically optimize her payoff, using common or interrelated resources, whose state evolves in response to decisions made by all players, and there may be also other dependences between a player's payoff and strategies of the other players. Examples are fishing in common or interrelated fisheries, transoundary pollution, behaviour of firms at a common market, space debris, trafic jams or frequency assignment.
The role of the candidate will be examination of existing models and creating new ones – mainly using tools of dynamic optimization, as well as numerical simulations, writing scientific papers and presenting results on seminars and conferences.

**Requirement**

- MSc diploma in mathematics, informatics, economics or related fields,
- Deep undestaniding of mathematical analysis of one and several variables, ordinary differential equations, and foundations of game theory and optimization.
- English,
- Ability to write in LaTeX,
- Ability to use mathematical symbolic or numerical analysis packages (e.g. Mathematica, Matlab)

**Discipline**: Mathematics

**Admission limit:** 1

**Recruitment schedule**

- registration in the Internet Registration of Candidates, referred to as "IRK", submitting an application to the IRK: 19.01 – 04.02.2021
- qualification procedure: 08.02-10.02.2021
- announcement of the ranking list: until 12.02.2021
- accepting documents from qualified candidates: 15 -25.02.2021 2 pm.
- announcement of the list of accepted candidates: until 26.02.2021

**Recruitment fee**

150 PLN

**Form of the selection procedure**

Evaluation of the following elements shall be taken into account in the selection process:

1) the research project proposed by the candidate;

2) scientific activity of the candidate based on a CV or resumé, documented with scans of materials attached to the application for admission to the School;

3) interview with the candidate;

**Language of the selection process, including the interview**

The interview shall be carried out in Polish or English – in accordance with the candidate's preferences presented in IRK. If the Polish language is selected, the interview may include parts in English.

**Required documents**

The candidate shall submit the application for admission to the School only in IRK. It shall include:

1) the application for admission to the Doctoral School;
2) scan of a diploma of completion of the long-cycle Master's degree programme or second-cycle programme or an equivalent diploma obtained under separate regulations in mathematics, informatics, economics or a related field, or –in the case of candidates pursuing education within the European Higher Education Areas –a declaration that the diploma or certificate of obtaining a Master's degree shall be provided by 25 February 2021, in the case of holding a diploma equivalent to the diploma of completion of the long-cycle Master's degree programme or second-cycle programme, the candidate shall justify this equivalence;
3) a description of the initial research project proposal in English;
4) a resumé or curriculum vitae containing information about scientific activities, including scientific interests and scientific achievements during five calendar years preceding the submission of the application, subject to § 18 s. 5, in particular publications, research and organisational work in scientific associations, participation in scientific conferences, participation in research projects, awards, distinctions, research internships, completed training courses on research skills, science popularisation activities, activities in bodies representing scientific societies, professional career;
5) scans of materials confirming scientific activities referred to in the resumé or CV;
6) a document confirming the command of English at least at B2 level or declaration about the command of English to the extent enabling the education in the school;
7) a scan of the declaration of the supervisor candidate about their willingness to be the candidate's supervisor and the number of doctoral students, for whom them are appointed as the supervisor, in accordance with the template determined by the Rector; additionally, the candidate can enclose a scan of the opinion of the supervisor candidate and opinions of other academic staff on the candidate and their scientific activities or the proposed research project;
8) one photograph of the candidate's face, allowing their identification;
9) declaration whether the candidate is or was a doctoral student or participant of doctoral studies, and if yes – title of doctoral dissertation or the research project prepared by the candidate, as well as first name and surname of the academic tutor or the supervisor;
10) declaration on familiarising themselves with the content of the Resolution, as well as Article 40 and Article 41 of the Code of Administrative Procedure;
11) scans of transcripts of records of the first and second cycle programmes, the long-cycle Master's degree programme or equivalent documents (e.g. diploma supplement);

12) abstract of the master's thesis or draft master's thesis in English (up to 3,000 characters with spaces);

13) other documents in form of scans: two letters of recommendation from scentists knowing the applicant

**Evaluation criteria** for applications meating formal requirements:

The scholarship committee evaluates each application (academic achievements, research experience and ability to meet the requirements in the research project), on a point scale:

- academic achievements, including scientific papers published in renowned scientific magazines/periodics (50% of the final grade):

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| 4 pts | outstanding; |
| 3 pts | very good; |
| 2 pts | good; |
| 1 pts | poor; |
| 0 pts | no academic achievements. |

- Achievements resulting from research, scholarships, awards and research experience gained in Poland or abroad, workshops and scientific training, participation in research projects (20% of the final grade):

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| 4 pts | outstanding (e.g. scholarschips, internships in leading foreign centers, prestigious international awards or distinctions, workshops or training courses in leading research centers, participation in international or foreign projects); |
| 3 pts | significant (scholarships, internships in good domestic and foreign centers, national awards or prizes, foreign or national workshops or training, participation in domestic or foreign projects); |
| 2 pts | moderate (local awards or prizes, workshops or trainings, participation in university projects); |
| 1 pts | poor achievements; |
| 0 pts | no avievements. |

- competences to carry out specific tasks in the research project (30% of the final grade):

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| 3 pts | very good; |
| 2 pts | good; |
| 1 pts | poor; |
| 0 pts | no competences. |

**Education program**

The education lasts 4 years. It includes obligatory classes (no more than 300 hours in total during the whole period of education) and the implementation of an individual research program, carried out under the supervision of a supervisor. Beginning of education - March 1, 2021.

**Scholarships**

The PhD student receives a scholarship in the amount of PLN 4125,00 gross gross (for the duration of the research project). After its completion, PhD student receives a scholarship in the amount provided for in the general regulations.