



AGREEMENT FOR INTERNATIONAL JOINT DOCTORATE

Considering the Polish Act of July 20, 2018 Law on Higher Education and Science (Journal of Laws from 2022, item 574, as amended)

and

the French decree of 25th May 2016 setting the national framework for training and the terms on the delivery of the national diploma of doctor degree and the decree of 26th August 2022 amending the Decree of 25 May 2016 on doctoral training.

Between the undersigned

POZNAN UNIVERSITY OF TECHNOLOGY (PUT), located at Plac Marii Skłodowskiej-Curie 5, 60-965 Poznan (Poland), represented by its Rector, Professor Teofil JESIONOWSKI.

Acting on behalf of the Faculty of Mechanical Engineering (FME) hereinafter the "FME" represented by its Dean, PUT Professor Olaf CISZAK, D.Sc. Eng.

and

UNIVERSITE POLYTECHNIQUE HAUTS-DE-FRANCE (UPHF), located at Le Mont Houy, 59313 Valenciennes Cedex 9 (France), represented by its President, Professor Abdelhakim ARTIBA.

Acting on behalf of the Laboratory for Automation, Mechanical Engineering Information Sciences and Human-Machines Systems (Joint Research Unit 8201), hereinafter referred to as "LAMIH", directed by Mr. Laurent DUBAR.

Both Parties desire to encourage doctoral student exchanges, thus reinforcing both the scientific and academic co-operation between Poland and France. They have decided mutually, in compliance with the legal and statutory terms applied in their own countries, to use the joint doctoral supervision procedure for:

Mr. François BERKMANS

Nationality : French

Address in France 45 faubourg Fauroeulx

59530 LE QUESNOY

Email : berkman19@gmail.com

They have also agreed to respect the following conditions:

1. GENERAL CONDITIONS

1.1. Registration for a Joint Doctorate

1.1.1. Candidate

François BERKMANS, hereafter referred to as "the candidate", is authorized to prepare a doctoral dissertation in the discipline corresponding to the point 3.3 of this document provided that the candidate satisfies the registration conditions of both institutions and of the concerned doctoral schools. It is required at PUT, that the candidate is accepted to the Doctoral School based on the positive results of the competition procedure, and admission to the Doctoral School is confirmed by entering the candidate into the register of doctoral students. The candidate entered on the register of doctoral students begins education and acquires the rights of a doctoral student at the moment of oath taking.

The title of the candidate's doctoral dissertation is: *Multi-scale characterization of local curvatures of surfaces*.

The description of the doctoral research project is the subject of a scientific annex (Scientific Annex 1), which is an integral part hereof.

1.1.2. Beginning and length of the preparation

The registration entry date into the register of doctoral students is scheduled for academic year 2021/2022 at UPHF and for the winter semester 2022/2023 at PUT. The doctoral dissertation defence is scheduled during the 48th month after his first registration, i.e. the academic year 2021/2022. In exceptional cases, this time period can be extended through a specific written agreement between the representatives of the institutions signing the present agreement, on joint proposal of the two supervising professors and after recommendation of the concerned Doctoral School.

In PUT, the mid-term assessment of the implementation of the individual research plan by the doctoral student is carried out in the middle of the period of education (i.e., after 23 months of starting the candidate's education at the Doctoral School), in compliance with the internal regulations of PUT.

In France, an committee named "Comité de suivi" must be set up every year for each doctoral student.

1.2. Working Schedule

The doctoral dissertation will be prepared in both institutions, that is, alternately in PUT and UPHF, until the research activities are completed. The timetable of the work periods in both institutions is to be defined during the project, in a balanced manner according to scientific requirements.

The following provisional time table is:

- 21/06/2021 to 20/12/2022 (UPHF)
- 21/12/2022 to 20/06/2025 (PUT)

The candidate commits to abide by the regulations in force in both institutions, in particular the rules of procedure applicable within the laboratories concerned.

2. ADMINISTRATIVE CONDITIONS

2.1. Registration fees

Throughout the preparation period, the candidate will simultaneously be registered at the PUT and at the UPHF. Education at PUT is free of charge. At UPHF, the candidate will pay the total registration fee at UPHF during his stay for the academic year 2022/2023.

2.2. Health insurance

The candidate shall check whether he is covered by his health insurance in both countries and shall sign a civil liability insurance contract.

2.3. Accommodations

During the candidate's stay at the host institution, described in paragraph 1.2, the host institution will, at the candidate's request, endeavour to arrange on-campus accommodation for the candidate. The candidate will be charged for this accommodation in accordance with the current standard rates.

2.4. Doctoral dissertation grant

The doctoral dissertation preparation will be financed as follows:

- at PUT, a doctoral student (candidate) receives a doctoral scholarship on the principles set out in Art. 209 of the Polish Act,
- at UPHF, the candidate receives a doctoral scholarship during the doctoral project realized at UPHF in France.

3. EDUCATIONAL CONDITIONS

3.1. Supervisors

The doctoral dissertation will be jointly supervised by:

- Michał Wieczorowski, Professor at PUT,
- Maxence Bigerelle, Professor at UPHF.

Both supervisors will ensure the continuous and thorough supervision of the research activities carried out by the candidate during the entire doctoral project. The candidate, in consultation with the supervisors, shall draw up an individual research plan, and shall submit it to the Director of PUT Doctoral School within 12 months of the date commencement of education. Furthermore, the supervisors, designated above, will maintain close frequent contact by all available means. Both institutions signing this agreement commit themselves to facilitating these contacts.

Costs of the supervisors (including a gratification, if provided) will be paid by the appropriate Parties according to the local rules in this matter, that is, costs of the Polish supervisor will be paid by the Polish side, while costs of the French supervisor will be paid by the French side.

3.2. Preparing, writing and defending the doctoral dissertation

3.2.1. Doctoral school

During his stay at UPHF, the candidate shall follow a training course of the Doctoral School Polytechnique Hauts-de-France equal to 30 ECTS points.

During his stay at PUT, the candidate is required to pursue the Curriculum of the Doctoral School and obtain learning outcomes for level 8 qualifications of the Polish Qualifications Framework (PQF).

3.2.2. Language(s) of the doctoral dissertation

The doctoral dissertation will be written in English.

A substantial summary of the doctoral dissertation (including the conclusions of the doctoral dissertation) will be drafted in English, Polish and in French.

The oral presentation of the doctoral dissertation will be delivered in English.

3.2.3. Composition and designation of the jury (committee) and reviewers

Both Parties will together propose and accept 3 reviewers who will prepare three independent reviews of the doctoral dissertation according to the requirements imposed by the law regulations of Poland and France. One of the reviewers will be proposed by the Polish side (or by the French side) and the two others will be proposed by the French side (or by the Polish side). Costs of the reviewer(s) proposed by the Polish side, including a gratification, will be paid by the Polish side, while costs of the reviewer(s) proposed by the French side, if any, will be paid by the French side.

The jury (committee) set up for the public doctoral dissertation defence will meet both the legal and statutory terms in effect in the two countries – Poland and France. The jury must be composed of a well-balanced number of scientific representatives proposed by both universities. The jury will have 8 members with a right to vote except for the two supervising professors, including: the jury (committee) chair (designated and accepted by both Parties), the two supervising professors designated in paragraph 3.1, three reviewers of the doctoral dissertation, and two additional members if the current law regulations in Poland accept this kind of the jury (committee). The jury (committee) will be supported by a secretary member, who will not have a right to vote. If the current law regulations in Poland accept this kind of the jury (committee) it will include at least 50% of professors (or similar) and external members from both institutions with a balanced representation of women and men if possible.

The candidate shall be authorized to defend his doctoral dissertation by both institutions, in compliance with their current legal and statutory requirements.

3.2.4. Place of the doctoral dissertation defence

It is agreed that the doctoral dissertation defence will be conducted either remotely, using a videoconference system, if the current law regulations in Poland and in France accept this kind of defence, or in person at PUT or at UPHF. All the costs of travels and accommodation of the jury (committee) members will be paid by the appropriate Parties, that is, costs of Polish members will be paid by the Polish side, while costs of French members will be paid by the French side.

3.2.5. Manuscript submission

The terms for submission, identification and reproduction of the doctoral dissertation are governed by the legal and statutory terms applicable to both countries.

3.3. Presentation of the diplomas

After the due deliberations of the joint jury, both countries will each award the candidate their usual doctor degree:

- at PUT: "Doctor degree in the field of engineering and technology sciences",
- at UPHF: "Doctor of the Université Polytechnique Hauts-de-France in the field of engineering sciences".

In both cases, the text of the doctoral diploma handed over to the candidate will satisfy requirements imposed by the law regulations of Poland or French, respectively, and will state that the doctoral dissertation has been completed under the international joint supervision by referring to both institutions concerned.

PUT is responsible for entering relevant candidate's data into the POL-on system imposed by the law regulations of Poland.

4. OTHER CONDITIONS

4.1. Intellectual property rights

The intellectual property rights not resulting from the doctoral dissertation research carried out, remain the property of the party who holds them.

In case the results stemming from research carried out within the framework of the doctoral dissertation (hereinafter "Results") should be the object of intellectual property rights, the Parties and the candidate will agree jointly on the modalities of protection and exploitation required in a specific contract.

4.2. Confidentiality

The Parties, as well as the candidate, make a commitment to consider the Results as well as the information of all kind, communicated by any ways, knowledge of which they could acquire during of the execution of the present agreement as strictly confidential, except for those expressly designated as non-confidential. This obligation of confidentiality is in force for the term of the present agreement and for the year following its expiry or its termination.

4.3. Publications – Communications

The research carried out during the doctoral project, and in particular the Results, which will be the object of publications or communications require, during the term fixed in article 4.2, a preliminary agreement of the Parties and the candidate. Each of the three Parties involved can propose any comments to the agreement no later than within thirty (30) calendar days of its drawing. Consequently, after this period and in the absence of any negative comment, the agreement of the Parties is considered granted. The names of the Parties, in particular, the names of the involved laboratories or institutes, the names of the supervisor(s) of the doctoral dissertation, as well as the candidate's name should be mentioned in these publications and / or communications.

4.4. Validity

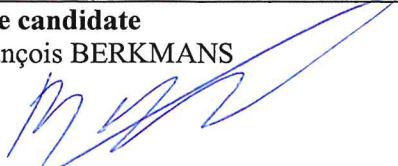
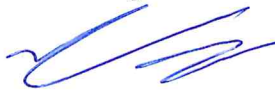
The terms of the present agreement take effect on the first registration of the candidate at one of the institution, i.e. academic year 2021/2022. They remain valid until the date of the doctoral dissertation defence stipulated in paragraph 1.1.2, with an additional period to cover the time needed to write and transmit the diplomas described in paragraph 3.3.

In the best interest of their doctoral students and to encourage the development of inter-university and international cooperation, both of the above mentioned Parties commit themselves to comply with the conditions stipulated above. They agree to take all the necessary steps to apply the present agreement under the best conditions.

In case of disagreement or dispute, the signatories of the present agreement agree to seek an amicable settlement before deciding to cancel the present agreement.

If either of the concerned Parties denounces the present joint supervision regulations, the denouncing Party must notify the other Party of this in writing, specifying the reasons for this decision.

Executed in 3 originals in English.

The candidate François BERKMANS  Signed in Valenciennes, (date)	
The supervisor Poznan University of Technology Professor Michał Wieczorowski, Ph.D., D.Sc.  Signed in Poznan, (date)	The supervisor Université Polytechnique Hauts-De-France Professor Maxence Bigerelle  Signed in Valenciennes, (date)
For Poznan University of Technology The Rector, Professor Teofil Jesionowski, Ph.D., D.Sc.   Stamp and Signature: <i>prof. dr hab. inż. Teofil Jesionowski</i>	For Université Polytechnique Hauts-De-France The President, Professor Abdelhakim ARTIBA   Stamp and Signature:

Jacek Nowak
 Radca Prawny
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ANNEX 1: SCIENTIFIC ANNEX

Multi-scale characterization of local curvature of surfaces

Issue

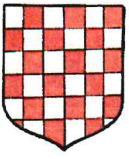
In the case of a topographic surface, a strong added value that is not currently studied is to analyse non-homogeneous surfaces by segmenting them into categories of objects and attaching a semantic field to them. In fact, each trade or academic field concerned with the analysis of morphological surfaces seeks to assign a specific terminology to a surface appearance in order to characterise it. A terminology to try to characterise a topographic defect has been introduced in the ISO 8785 standard (31 typical surfaces), but it does not allow the whole surface to be described and is limited to a typical localised defect: striae, pore etc. Given the lack of a common descriptive language, it is very difficult to describe a surface universally according to a given descriptive syntax, as each trade usually develops its own language for use within its own research community. Indeed, each profession invents its own jargon which is totally impenetrable to the outside community. This is a real challenge. Heraldry is the science of blazon, i.e. the study of coats of arms. "Blazoning" means "describing" coats of arms according to the rules of heraldic science. Strictly speaking, blazon is therefore a statement, which can be oral or written. It is the description of the coat of arms made in a technical language, the heraldic language (what is called "blazoning"). This language is coded and allows a morphological description to be associated with a textual description in a unique way (guaranteeing uniqueness and therefore bijection). By its morphological decomposition in layers, this heraldic science appears to us as a tool of analogical type particularly adapted to describe the heterogeneities of rough surfaces. Our goal will be to develop a language largely inspired by the vocabulary and syntax of heraldry to describe rough surfaces, and beyond that, topographic objects integrating a number of characteristics and/or particularities that can be recognized in the said language of heraldic inspiration.

Semantic description of a rough surface

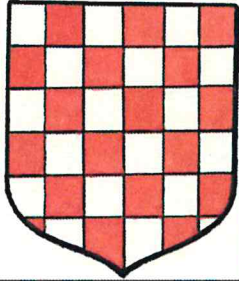
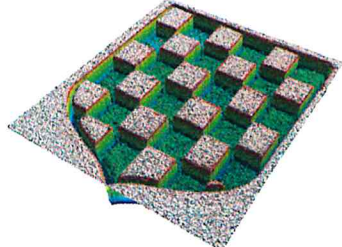
It is then necessary to look at the real surface as a single semantic description on which we can attach the properties of this or that object. An Object can thus be seen as a stack of layers that decompose it. The image on the right shows, at high magnification, a painted fireplace and its decomposition into layers. By describing the syntactic park of the topographic object under investigation, it becomes possible to characterise complex and rich surfaces. This is a growing demand, especially in biological and natural environments. It is then sufficient to group together the local semantic parks $P_k(e)$ grouping together equivalent syntactic descriptors $D_{i,j}(e)$ of an area of the work viewed at a given scale e to characterise it and link it to the topographic data $T_{i,j}(e)$, the colour data $C_{i,j}(e)$ and the reflectometric data $R_{i,j}(e)$.

Description of a topographic object by heraldic science

Let's start with one of the IRHT (Institut de Recherche et d'Histoire des Textes, part of the CNRS) data sheets. As a reminder, this file was compiled from the drawn/painted coats of arms contained in the manuscripts of the collections of the ancient holdings of the Paris libraries (Bibliothèque nationale de France; Bibliothèque de l'Arsenal; Bibliothèque Mazarine; Bibliothèque Sainte-Geneviève) and of the Archives nationales de France. This coat of arms and its identification are taken from a manuscript of the Bibliothèque Mazarine in Paris, MS. 2909 (1st half of the 18th century), folio 217.

 DURAT (François de) councillor in Parlement de Paris, 1569 échiqueté d'argent et de gueules de six pièces. PARIS, Bibl. Mazarine 2909 (c. 1750) fol 217 M.S.	The present sheet has been drawn up on the basis of a coat of arms identified with that of François de Durat, who died in 1569 and who was a councillor in the Parliament of Paris in the 16th century. His coat of arms reproduced on this sheet is described (blazoned) as follows: « échiqueté d'argent et de gueules de six pièces » ("chequy argent and gules of six"), which means that it is a "quadrille" with six horizontal entries and six vertical entries alternating white and red squares, the upper left square being white (argent).
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Let us now measure a rough surface of a nanostructured glass by interferometric measurement.

Universal heraldic description of the rough surface <i>Echiqueté d'argent de gueules sur six stries</i>		
Interferometric measurement of a Nanostructure Wafer	Blazon described by the CNRS	Morphological Reconstruction The coat of arms
		

We see that it is possible to describe the topographic surface by the unambiguous sentence '*Echiqueté d'argent de gueules sur six stries*'. All that remains to be done is to extend the heraldic description by a colour/height correspondence and the size of the measured surface so that the surface is metrologically defined.

