



MASTER DISSERTATION CONTRACT

Ghent University, public institution with legal personality, having its administrative offices in Belgium, 9000 Gent, Sint-Pietersnieuwstraat 25, company registration number 0248.015.142, duly represented by Prof. dr. Rik Van de Walle, rector, for whom the director of studies acts by delegation pursuant to the Board of Governors' decision (hereinafter referred to as "UGent")

Student	Name Quinten Beeckmans		
Place of residence	Hertjen 126 Sint-Niklaas 9100		
(hereinafter the "Student")			
Company – Receiving Organisation	Name <i>Ogkon</i>		
Official address - company registration number – legal representative	Sint-Jacobsnieuwstraat 17 9000 Gent		
(hereinafter the "Organisation")			
Master Dissertation	Title / Subject Next-generation scheduling using reinforcement learning principles		
(hereinafter the "Master Dissertation")			
Curriculum	EMCOSC - Master of Science in Computer Science Engineering		
Start Date	23/09/2022	End Date	25/05/2023
UGent department	INTEC	Supervisor Organisation	<i>Tom Tourwé</i>

The Student shall carry out scientific research in the preparation of his/her Master Dissertation to obtain a Master's degree at Ghent University.

The Organisation is interested in the topic of the Master Dissertation and wishes to support the Student's research.

UGent's role is strictly limited to providing support to the Student. Under this Agreement, no services are offered or rendered by UGent to the Organisation.

This Agreement consists of this **Signing Page**, the **Terms and Conditions**, the **Technical Annex** and any annexes as listed in the Technical Annex. In case of conflict between these documents, the provisions of the Technical Annex will prevail.

This Agreement constitutes the entire agreement between the parties and supersedes all prior arrangements, understandings, representations and communications, oral or written with respect to its subject matter.

For the Organisation		For Ghent University	
Signature	DocuSigned by: <i>tom tourwé</i> F3C21A0D83DC493...	Signature:	<i>Hennie De Schipper</i>
Name:	Tom Tourwé	Name:	director of studies
Position:	Head of AI	Position:	13/01/2023
Date:	28/10/2022	Date:	
The Student		UGent Promoter	
Signature	DocuSigned by: <i>Quinten Beeckmans</i> 3F769AA85CD9464...	Signature:	<i>Bart Dierckx</i>
Name:	Quinten Beeckmans	Name:	23/12/2022
Date:	28/10/2022	Date:	

=== END SIGNING PAGE ===

GENERAL TERMS – MASTER DISSERTATION

1 DEFINITIONS

"Agreement": this agreement, including its annexes and any amendments;

"Background": information, techniques, Knowhow, software and materials regardless of the form or medium in which they are disclosed or stored – including the relevant Intellectual Property - that are provided by one party to the other for use in the Project whether before or after the Start Date as indicated on the Signing Page of this Agreement;

"Confidential Information": Background or other information disclosed by one party to the other(s) for use in the Project and identified in writing as confidential before or at the time of disclosure, or the confidential nature of which was confirmed in writing by the disclosing party within **ten calendar days** counting from the date of its disclosure;

"Intellectual Property": patents, trademarks, breeders' rights, designs, database rights, software, copyright, topographies of semiconductors, applications for any of the above, and any similar right recognised from time to time in any jurisdiction, together with all rights of action in relation to the infringement of any of the above; Intellectual Property does not include copyright to Publications;

"Knowhow": technical information (including, without limitation, information relating to inventions, discoveries, concepts, methodologies, models, research, development and testing procedures, the results of experiments, tests and trials, manufacturing processes, techniques and specifications, quality control data, analyses, reports and submissions) and materials that are not, in the precise configuration and assembly of their components, generally known or readily accessible;

"Project": the research by the Student in preparation of his/her Master Dissertation;

"Publication" / **"Publishing"**: the dissemination, regardless of the form or medium, of an abstract, article or paper for instance in a book, journal, online media, database or an electronic repository, or its presentation thereof at a public lecture, conference or seminar;

"Results": Knowhow, materials and other information first reduced to practice or writing in the course of the Project as reported in accordance with clause 2.2.

2 THE PROJECT

2.1 The scope of this Agreement is limited to the Background and activities of the research group of the Promotor and his or her immediate staff. Accession of other UGent departments, research groups, laboratories or researchers will require a formal amendment of this Agreement.

2.2 The Student shall regularly report to UGent on the progress of the Project and the obtained intermediary Results. At the term of this Agreement, the Student shall prepare and present a final report on the Project and the Results to UGent and to the Organisation.

2.3 The Student shall carry out the Project on a best effort basis, but does not undertake that any research will lead to any particular result, nor does the Student guarantee a successful outcome to the Project ("middelenverbintenis").

3 FINANCIAL (AND OTHER) COMPENSATIONS OR CONTRIBUTIONS

3.1 Except where expressly stipulated otherwise in the Technical Annex, no financial or other compensations shall be due by either the Organisation or UGent.

4 BACKGROUND, RESULTS AND INTELLECTUAL PROPERTY

4.1 This Agreement does not affect the ownership of any Background. Background remains the property of the party that

contributes it to the Project or to its licensors. Each party shall fully own any improvements or new functionalities of its Background resulting from the performance of the Project. No licence to use any Background is granted or implied by this Agreement except for the rights expressly granted in this Agreement.

4.2 Each party grants the other a royalty-free, non-exclusive licence to use its Background for the sole purpose of carrying out the Project. Neither party may grant any sub-licence to use the other's Background.

4.3 The Organisation shall own the Intellectual Property in the Results and may take such steps as it may decide from time to time, and at its own expense, to register and maintain any protection for that Intellectual Property. In case a patent application is filed by the Organisation, the name of the inventors (-students) of UGent, if any, will be mentioned. The Student shall offer any reasonable support to the Organisation in the registration and protection of its Intellectual Property in the Results.

4.4 Subject to its confidentiality obligations as set out in article 6 and subject to the procedures as described in article 5, UGent (and each employee and student of UGent) will have the irrevocable, royalty-free right to use the Results for the purposes of academic teaching and academic research.

5 PUBLICATION

5.1 For the duration of the confidentiality obligations as stipulated in article 6, any party wishing to Publish (the "Publishing party") shall submit a draft of any proposed Publication concerning the Project in writing to the other party at least **thirty calendar days** before the date of the proposed submission for Publication. The other party can, by giving written notice to the Publishing party (a "Confidentiality Notice"):

- (a) prevent the Publication of its Confidential Information; or
- (b) delay the proposed Publication for a maximum of four months after receipt of the Confidentiality Notice if, in the its reasonable opinion, such delay is necessary in order to seek patent or similar protection for any of its Background or any Results which are the subject of the intended Publication; or
- (c) prevent the Publication of specific Results where such Publication would cause disproportional harm to its legitimate interests

5.2 Any valid Confidentiality Notice must contain a precise and motivated request for necessary adaptations to the intended Publication. If such objection has been raised, the parties will discuss how to overcome the justified grounds for the objection on a timely basis (for example by adapting the planned Publication and/or by protecting Background or Results before Publication). The opposition to the intended Publication will not be unreasonably continued if appropriate actions have been taken following the discussion. Any valid Confidentiality Notice must be sent within **fifteen calendar days** after receipt of the draft Publication. If the Publishing party does not receive a Confidentiality Notice within that period, it may proceed with the proposed Publication.

5.3 Notwithstanding a timely communication of a Confidentiality Notice in accordance with clause 5.1, the Student will at all times be able to present and defend his Master Dissertation in accordance with the UGent examination decrees and regulations. Upon receipt of the Organisation's Confidentiality Notice, the parties shall confer on the appropriate measures to be taken to ensure proper confidentiality of the Organisation's Confidential Information or Results that the Organisation wishes to remain confidential.

6 CONFIDENTIALITY

- 6.1 For the duration of this Agreement and a further period of **three** years counting from its term or termination, neither party shall disclose to any third party, nor use for any purpose except the carrying out of the Project, any of the other party's Confidential Information.
- 6.2 The parties shall limit disclosure of any Confidential Information to only those of their employees, contractors or students (if applicable) to the extent necessary for the performance of the Project. The parties will use diligent efforts to make a selection of the above-mentioned persons and ensure that each of them preserves and protects the confidentiality of all Confidential Information in accordance to the confidentiality obligations under this Agreement.
- 6.3 Neither party will be in breach of any obligation to keep any information confidential and limited use to the extent that it can reasonably prove that such information:
- (a) was known by or in possession of the receiving party prior to the time Confidential Information became available to the receiving party;
 - (b) is in the public domain, except by breach of this Agreement or other unauthorized act or omission;
 - (c) was lawfully and in good faith made available to the receiving party without restriction by a third party who is not subject to obligations of confidentiality with respect to such Confidential Information;
 - (d) was independently developed by the receiving party without access to, use of or reference to the Confidential Information;
 - (e) was disclosed pursuant to the order of a court of competent jurisdiction after the disclosing party was given reasonable notice of such order and was given an opportunity to oppose such disclosure; or
 - (f) was cleared for dissemination by the disclosing party.
- 6.4 Parties will not be in breach of any obligation to keep information confidential or to use Confidential Information by Publishing any of the same if parties have followed the procedure in article 5.
- 6.5 Neither party shall use the other party's name, trademarks or logo for promotional or advertising purposes without express written consent. In all other communications concerning the Project (including any Publication), the parties shall refer to each other as customary (in accordance with good academic practice).

7 WARRANTIES - LIMITATIONS OF LIABILITY

- 7.1 The parties ensure that they shall respect human rights.
- 7.2 The Student can in no way be considered as acting as an employee of UGent or the Organisation. Neither UGent nor the Organisation can therefore be held responsible for any default in Student's performance of this Agreement.
- 7.3 When visiting the Organisation, Student shall comply with all safety regulations communicated by the Organisation.
- 7.4 Neither of the parties makes any representation or gives any warranty to the other that any advice or information given by it or any of its employees or students, or the content or use of any Results, Background or materials, works or information provided in connection with the Project, will not constitute or result in any infringement of third-party rights.
- 7.5 Neither party accepts any liability or responsibility for any use by any other party of any Background or Results, nor for any reliance which may be placed by that other party on any Results, nor for advice or information given in connection with any Results.

- 7.6 The liability of either party to the other for any breach of this Agreement, any negligence or arising in any other way, whether direct or indirect, out of the subject matter of this Agreement, the Project and the Results, will not extend to any indirect damages or losses, or to any loss of profits, loss of revenue, loss of data, loss of contracts or opportunity, whether direct or indirect, even if the party bringing the claim has advised the other of the possibility of those losses, or if they were within the other party's contemplation.

- 7.7 UGent has an insurance policy which covers the civil liability which can be imposed on the university entity of UGent. Insured are UGent, its departments, its staff, and its students. UGent, UGent's civil liability insurer and the Student waive their right of recourse against the Organisation and the Organisation's accountable persons only to the extent any warranties of the Organisation's accountable persons' insurance policy are either lacking or have been exhausted. The Organisation, the Organisation's accountable persons and their insurer(s) waive any right of recourse against UGent, UGent's insurer and the Student to the extent any warranties of UGent's insurance policy are either lacking or have been exhausted.

- 7.8 UGent has an insurance policy which covers the Student for physical accidents occurring during or on the way to and from university activities.

8 TERM AND TERMINATION

- 8.1 If the performance by either party of any of its obligations under this Agreement is delayed or prevented by circumstances beyond its reasonable control, that party will not be in breach of this Agreement because of that delay in performance. However, if the delay in performance is more than three months, the other party may terminate this Agreement with immediate effect by giving written notice to the other party.
- 8.2 This Agreement shall take effect on the Start Date as indicated on the Signing Page. If this Agreement is executed after the Start Date, then it shall apply retroactively. This Agreement terminates automatically on the End Date as indicated on the Signing Page.
- 8.3 Each of the parties may terminate this Agreement with immediate effect by giving written notice to the other party if:
- (a) the other party is in breach of any provision of this Agreement and if such breach is capable of remedy, the breach has not been remedied within **ten calendar days** after receipt of a written notice specifying the breach and requiring its remedy;
 - (b) proceedings are instituted against the other party under any bankruptcy law, if the other party becomes insolvent, or if an order is made or a resolution is passed for its winding up (except voluntarily for the purpose of solvent amalgamation or reconstruction), or if an administrator, administrative receiver or receiver is appointed over the whole or any part of the other party's assets, or if the other party makes any arrangement with its creditors; or
 - (c) the other party is involved in a serious or systematic violation of human rights.
- 8.4 In addition to the stipulations of clause 8.3, this Agreement can also be terminated with immediate effect by giving written notice to the other party:
- (a) by UGent, the Organisation and Student in the following cases:
 - 1. gross negligence in the performance of its obligations under this Agreement or in observing the applicable regulations; or
 - 2. bad faith or misconduct;
 - (b) by the Organisation and UGent in case of:
 - 1. unauthorized absence by the Student; or

2. in case the normal performance of this Agreement has become impossible;
 - (c) by UGent and the Student in case of physical or mental health risk to the Student.
- 8.5 After termination of this Agreement, any obligation which by its nature extends beyond the term or termination of this Agreement, will remain in full force and effect.
- 9 PROTECTION OF PERSONAL DATA**
- 9.1 The parties commit themselves to respect the European Regulation EU 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (GDPR) as well as the national applicable laws.
- 9.2 The parties may share personal data of individuals involved in the collaboration such as: name, business telephone, address, and email ("Business Contact Information"). Each party may store and otherwise process such Business Contact Information. The parties agree that Business Contact Information will only be processed for administrative purposes to the limited extent as required for the performance of this Agreement.
- 9.3 If the processing of other than Business Contact Information is necessary for the performance of this Agreement, the parties commit themselves to agree and enter into a data processing agreement, which shall be attached to this Agreement to constitute the entire agreement between the parties in order to reflect each party's rights and obligations in this respect. In case of any conflict between the data processing agreement and this Agreement, the provisions of the data processing agreement shall prevail in relation to the matters covered by the data processing agreement. For all other matters the provision of this Agreement shall prevail.
- 10 GENERAL**
- 10.1 Assignment: Neither party may assign or transfer this Agreement as a whole, or any of its rights or obligations under it, without first obtaining the written consent of the other party. That consent may not be unreasonably withheld or delayed.
- 10.2 Illegal/unenforceable provisions: If the whole or any part of any provision of this Agreement is void or unenforceable in any jurisdiction, the parties shall negotiate to replace such invalid, illegal or unenforceable provision with a valid, legal and enforceable provision which comes as close as possible to that of the invalid, illegal or unenforceable provision. The other provisions of this Agreement, and the rest of the void or unenforceable provision, will continue in force in that jurisdiction, and the validity and enforceability of that provision in any other jurisdiction will not be affected.
- 10.3 Waiver of rights:** If a party fails to enforce, or delays in enforcing, an obligation of the other party, or fails to exercise, or delays in exercising, a right under this Agreement, that failure or delay will not affect its right to enforce that obligation or constitute a waiver of that right. Any waiver of any provision of this Agreement will not, unless expressly stated to the contrary, constitute a waiver of that provision on a future occasion.
- 10.4 No agency:** Nothing in this Agreement creates, implies or evidences any partnership or joint venture between the parties, or the relationship between them of principal and agent. Neither party has any authority to make any representation or commitment, or to incur any liability, on behalf of the other.
- 10.5 Formalities.** Each party will take any action and execute any document reasonably required by the other party to give effect to any of its rights under this Agreement.
- 10.6 Amendments:** No variation or amendment of this Agreement will be effective unless it is made in writing and signed by each party's authorised representatives.
- 10.7 Export:** The parties shall adhere to all applicable export control laws and regulations, including Council Regulation (EC) No. 428/2009 of 5 May 2009 setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items, and inform each other if goods, software or technology are affected by export control laws and regulations. The export of goods, software or technology outside the European Union may be subject to an export license provided by the relevant authority.
- 10.8 Jurisdiction and governing law:** This Agreement is governed by, and is to be construed in accordance with Belgian Law, except for its provisions of international private law. The courts of the judicial district of East Flanders, department Ghent, will have exclusive jurisdiction to deal with any dispute which has arisen or may arise out of or in connection with this Agreement, except that either party may bring proceedings for an injunction in any jurisdiction.
- 10.9 Escalation:** If the parties are unable to reach agreement regarding a dispute on any issue concerning this Agreement **within fourteen calendar days** after one party has notified the other of that issue, they will refer the matter to the rector or any person appointed by him in the case of UGent, and to a person appointed by the Organisation and the Student in an attempt to resolve the issue **within ten calendar days** after the referral. Either party may apply to the court for an injunction in accordance with clause 10.8 if the matter has not been resolved within that period.
- ===== END OF TERMS AND CONDITIONS =====

TECHNICAL ANNEX – MASTER DISSERTATION

Master Dissertation*Describe the Project*

Research the influence of Reinforcement learning on the scheduling problem. This ranges from increasing the difficulty of the scheduling problem to the dimensions, possible occurrences, and possible actions in the actions space. This alongside creating a working model using similar methods to DeepMind's Alpha zero or an alternative Reinforcement Learning approach to tackle the scheduling problem.

All possible complexities are benchmarked to see the influence of this added complexity and its usefulness for desirable planning.

Timing and deadlines

Final hand-in of MSc Thesis : 25-05-2023

Financial contributions – materials or facilities to be provided**Extra annexes**

Notices to the Organisation		Notices – UGent	
Name	Oqton	Dept.	TechTransfer
Dept.	AI chapter	Address	p/a Sint-Pietersnieuwstraat 25 9000 Gent Belgium
Address	Sint-Jacobsnieuwstraat 17 9000 Gent	Tel	0032 9 264 30 30
Tel	+32 498919473	E-mail	contracten@ugent.be
E-mail	tom.tourwe@oqton.com		

Invoicing (if applicable)		Important: a copy of all notices to UGent must be sent to the e-mail address of the promoter as indicated below	
Name		Promoter – UGent Name <i>Bart Olvest</i> Dept. <i>Information Technology</i> Tel <i>Bart Olvest @ugent.be</i> E-mail <i>Bart Olvest @ugent.be</i>	
Dept.			
Address			

Notices to the Student	
Name	Quinten Beeckmans
Address	Hertien 126 I Sint-Niklaas 91000
Tel	+32 470 38 75 20
E-mail	Quinten.Beeckmans@UGent.be

