



COLLABORATION RESEARCH AGREEMENT

BETWEEN

UNIVERSITI TEKNOLOGI MALAYSIA

("First Party ")

AND

UNIVERSITI MALAYSIA PERLIS

("Second Party ")

AND

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

("Third Party ")

AND

UNIVERSITI MALAYSIA PAHANG

("Fourth Party")

FOR THE PROGRAM ENTITLED

CRG10 TOMOGRAPHY LAB-ON-CHIP FOR MICROSAMPLE IMAGE RECONSTRUCTION

THIS **RESEARCH COLLABORATION AGREEMENT** (hereinafter referred to as "this Agreement") is entered into this2018

Between

1. **UNIVERSITI TEKNOLOGI MALAYSIA** (hereinafter referred to as "UTM") a university established under the Universities and University Colleges Act 1971 whose official address is at Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor Darul Ta'zim of the First Party;

And

2. **UNIVERSITI MALAYSIA PERLIS** an institution of higher learning (hereinafter referred to as "UniMAP") established and incorporated in Malaysia under the Universities and University Colleges Act 1971 [**P.U.(A) 23/2007**] and having its registered office at 1st, 2nd, 9th, 10th and 11th Floor, Bangunan KWSP, Jalan Bukit Lagi, 01000 Kangar, Perlis and shall include its lawful representatives and permitted assigns, of the Second Party;

And

3. **UNIVERSITI TUN HUSSEIN ONN MALAYSIA** (hereinafter referred to as "UTHM") a university established under the Universities and University Colleges Act 1971 whose official address is at Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Johor Darul Ta'zim of the Third Party;

And

4. **UNIVERSITI MALAYSIA PAHANG** (hereinafter referred to as "UMP") a university established under the Universities and University Colleges Act 1971 whose official address is at Canseleri Tun Abdul Razak, 26600 Pekan, Pahang of the Fourth Party.

(First, Second, Third and Fourth Party, are hereinafter collectively referred to as the "Parties" and "Party" refers to any of them, as the context may require)

WHEREAS

- A. The Grant conferred to the First Party during the term shall be in the sum of Ringgit Malaysia One Hundred Thousand (RM100,000.00) only to cover the research program entitled **CRG10 Tomography Lab-On-Chip For Microsample Image Reconstruction** (hereinafter referred to as "Research Program").
- B. The First Party agrees to conduct a research entitled **CGR10.1 Electrode-Based Tomography Lab-On-Chip Design and Development** (hereinafter referred to as

“Research Project 1”) with the sum of Ringgit Malaysia Forty Thousand (RM40,000.00) only to cover the Research Project 1.

- C. The Second Party has been invited by the First Party to participate in a research project entitled **CRG10.2 Data Acquisition System for Tomography Lab-On-Chip** (hereinafter referred to as “Research Project 2”) with the sum of Ringgit Malaysia Twenty Thousand (RM20,000.00) only to cover the Research Project 2.
- D. The Third Party has been invited by the First Party to participate in a research project entitled **CRG10.3 Tomography Lab-on-Chip Image Reconstruction** (hereinafter referred to as “Research Project 3”) with the sum of Ringgit Malaysia Twenty Thousand (RM20,000.00) only to cover the Research Project 3.
- E. The Fourth Party has been invited by the First Party to participate in a research project entitled **CRG10.4 Tomography Lab-on-Chip Modelling and Characterization** (hereinafter referred to as “Research Project 4”) with the sum of Ringgit Malaysia Twenty Thousand (RM20,000.00) only to cover the Research Project 4.
- F. The First Party is desirous of appointing the Second Party, the Third Party and the Fourth Party as collaborators for the Specific Project and the Second Party, the Third Party, and the Fourth Party have agreed to such appointment and shall contribute the sum of Ringgit Malaysia Twenty Thousand (RM20,000.00) to the Program.
- G. The Second Party, The Third Party and The Fourth Party here to have agreed to regulate their relationship in the spirit and upon terms and conditions set out hereunder.

NOW THEREFORE, in consideration of the promises and the mutual covenants serforth, the Parties agree as follows:-

DEFINITIONS AND INTERPRETATIONS

1.1 In this Agreement, the following words and expressions shall the meanings hereby assigned to then except where the context otherwise requires:

"Agreement" means this Agreement together with the appendices and attachment annexed heretoand any variation, amendment or supplement in the writing as may be agreed by the parties from time to time

"Background IPR" means any IPR controlled or owned by any Party prior to the date of commencement of this Agreement or IPR generated by any of the Parties independently of the Specific Project and controlled or owned by that Party or any IPR to which the Party has the necessary rights for the purpose of the Project

"CommencementDate" means 2018

"ConfidentialInformation"	means all information of a commercially sensitive nature including but not limited to specifications, drawings, circuit diagrams, tape, discs and other computer readable media, documents, techniques and know-how which are disclosed by one Party to the other for use in or connection with the Specific Project
"Grant"	means the grant in the aggregate sum of Ringgit Malaysia One Hundred Thousand (RM100,000.00) conferred to the First Party.
"Grant Agreement"	means the agreement entered into between first party, second party, third party and fourth part for the purpose of research collaboration
"IPR"	means any patent, registered design, copyright, database right design right, trade mark, trade name, application to register any of the aforementioned rights, trade secret, inventions, rights in know-how, right of confidence and any other intellectual or industrial property right of any nature whatsoever in any part of the world;
"Program"	means the research program entitled CRG10 Tomography Lab-On-Chip For Microsample Image Reconstruction;
"Specific Project"	means each individual project under the main project lead by the first, second, third and fourth party.
"Resulting IPR"	means any IPR arising from and developed in the course of Specific Project in which its proportion shall be determined by the Parties after the completion of the Specific Project.

1.2 Any reference in this Agreement to a statute or any provision of a statute shall be constructed as a reference to that statute of provision as amended, re-enacted or extended at the relevant time.

- 1.3 The heading in this Agreement and any reference thereto shall not be deemed to be part thereof or be taken into consideration in interpretation or construction of this Agreement.
- 1.4 Reference to Recitals, Articles, Sub-articles, Appendices and Attachments are reference to recitals, articles, sub-articles, appendices and attachments to this Agreement.
- 1.5 References to persons shall include incorporated persons, references to the singular include the plural and vice versa and references to the masculine include the feminine.

2. PURPOSE

2.1 The purpose of this Agreement is:

2.1.1 to specify the organisation of work between the Parties in carrying out the Specific Project and to set out the rights and obligations of the Parties; and

2.1.2 to carry out the Specific Project and to produce the Project Timeline and Deliverables as described in **Appendix 2**.

3. DURATION OF THE AGREEMENT AND COMPLETION

Notwithstanding the date of signing, this Agreement is deemed effective from the Commencement Date, and shall continue for a period of twenty four (24) months from the Commencement Date unless terminated earlier according to the provision of the Agreement.

4. OVERRIDING CONDITIONS

In all instances, until the completion of the Main Program, conditions laid down to the Main Project by First Party will override any agreement between the Parties concerning the Specific Project, including any terms contained in this Agreement.

5. RESEARCH PROJECT

5.1 Lead institution

5.1.1 The Parties hereto agree that by virtue of its capacity as the owner which owns the designated rights, title and intellectual or proprietary rights in the Main Program pursuant to the agreement, the First Party will be the lead institution for the Specific Project. The other Parties

also acknowledge that the First Party will act as their agent to deal with any third party and to sign any agreement on their behalf in relation to the Specific Project. Without prejudice to its authority to contract on behalf of the Parties in relation to the Specific Project the First Party shall notify the other Parties before signing agreements for the benefit of the Specific Project.

5.1.2 The Parties also agree and acknowledge that the First Party shall have complete control of the team members (“Team Member”) as listed in **Appendix 1** for the performance of the Specific Project and shall ensure that all the team members complies with the requirements as set forth in this Agreement.

5.2 Work Delivery

5.2.1 The Parties shall carry out the Specific Project in accordance to the Project Timeline and Deliverables in **Appendix 2** herein and shall from time to time throughout the duration of this Agreement abide and comply with the laws, rules and regulations applicable. Notwithstanding the foregoing, the Specific Project to be carried out by the Parties shall include any further refinements to the overall approach, deliverables and manning and reasonably accepted by the Parties to achieve the objective of the Specific Project.

5.2.2 The Parties shall carry out the Specific Project with due diligence and efficiency and in conformity with sound technical practices.

5.2.3 The Parties shall at all times perform the Specific Project for the purpose of the collaboration in such a manner as shall always safeguard and protect all Parties’ interests and take all proper steps to prevent abuse or uneconomical use of facilities, if any is made available by one Party to the other Party, and shall ensure the completion of the Specific Project to the satisfaction of both Parties.

5.3 Obligation of the Parties

5.3.1 Responsibilities of the First Party:

- (a) Shall be responsible for the day to day management of the Specific Project, monitor the progress of the Specific Project with respect to milestones and deliverables and will report to Second Party, Third Party and Fourth Party whenever is relevant.
- (b) Shall be responsible for the financial management of the Specific Project and will manage the Specific Project in accordance with appropriate project management techniques. The First Party shall

also maintain accurate and up-to-date accounting records of all funds, resources and material utilised in the Specific Project; and

- (c) Shall be responsible for the disbursement of the Grant to the collaborators under this Agreement, based on the manners as stated in Clause 6 and subject to the Project Disbursement Timeline from the First Party (**Appendix 3**); and
- (d) Be the sole and primary spokesperson.

5.3.2 Responsibilities of the Second Party:

- (a) Shall be responsible for the day to day management of the Specific Project, monitor the progress of the Specific Project with respect to milestones and deliverables and will report to First Party, Third Party and Fourth Party whenever is relevant.
- (b) Shall be responsible for the financial management of the Specific Project and will manage the Specific Project in accordance with appropriate project management techniques. The Second Party shall also maintain accurate and up-to-date accounting records of all funds, resources and material utilised in the Specific Project and
- (c) Shall be responsible for the disbursement of the Grant to the collaborators under this Agreement, based on the manners as stated in Clause 6 and subject to the Project Disbursement Timeline from the First Party (**Appendix 3**)

5.3.3 Responsibilities of the Third Party

- (a) Shall be responsible for the day to day management of the Specific Project, monitor the progress of the Specific Project with respect to milestones and deliverables and will report to First Party, Second Party and Fourth Party whenever is relevant.
- (b) Shall be responsible for the financial management of the Specific Project and will manage the Specific Project in accordance with appropriate project management techniques. The Third Party shall also maintain accurate and up-to-date accounting records of all funds, resources and material utilised in the Specific Project and
- (c) Shall be responsible for the disbursement of the Grant to the collaborators under this Agreement, based on the manners as stated in Clause 6 and subject to the Project Disbursement Timeline from the First Party (**Appendix 3**)

5.3.4 Responsibilities of the Fourth Party

- (a) Shall be responsible for the day to day management of the Specific Project, monitor the progress of the Specific Project with respect to milestones and deliverables and will report to First Party, Second Party and Third Party whenever is relevant.
- (b) Shall be responsible for the financial management of the Specific Project and will manage the Specific Project in accordance with appropriate project management techniques. The Fourth Party shall also maintain accurate and up-to-date accounting records of all funds, resources and material utilised in the Specific Project and
- (c) Shall be responsible for the disbursement of the Grant to the collaborators under this Agreement, based on the manners as stated in Clause 6 and subject to the Project Disbursement Timeline from the First Party (**Appendix 3**)

6. CLAIMS

The Second Party, the Third Party and the Fourth Party shall claim from the First Party any expenditure incurred in relation to the performance of responsibilities assigned to it (subject to maximum total allocation of RM20,000.00 for each Party), with supporting evidence by invoices, and/or other relevant document not later than thirty(30) days from the issuance of such invoices, and/or other relevant documents.

7. UNDERTAKINGS AND WARRANTIES

- 7.1 Each Party undertakes to each other to perform and fulfil on time the tasks and obligations assigned to under this Agreement.
- 7.2 The Parties warrant that they possess the relevant qualifications, experience and expertise in respect of the Specific Project to be rendered hereunder and are competent to so perform.
- 7.3 Each Party hereby undertakes to supply promptly to each other all such required information or documents as each Party need to fulfil obligations pursuant pursuant to this Agreement and shall use its best efforts to ensure the accuracy of any information or materials it supplies hereunder and promptly to correct any error there in of which it is notified
- 7.4 Towards each other, each Party undertakes to:
 - 7.4.1 Notify each other as a Party becomes aware any significant delay in performance; and

- 7.4.2 Use reasonable efforts to notify each other of any allegations of infringements of patent, copyright, trademark or other intellectual property rights in relation to the Specific Project that come to such Party's attention.
- 7.5 Each Party shall indemnify, keep indemnified and hold harmless the other Parties from and against all costs, expenses, liabilities, injuries, direct, indirect or consequential loss, damages, claims, loss of profits, loss of business, damages, claims, demands, proceeding or legal costs and judgements which they incur or suffer as a result of a breach of this Agreement or negligent acts or omissions or wilful misconduct of the Party and/or its Personnel including without limitation any resulting liability to any third party.
- 7.6 Notwithstanding anything contained in this Agreement, during the period of this Agreement, the Second Party, the Third Party and the Fourth Party warrant that they will not enter into any similar arrangement with third party which have the similar nature with the Main Project and/or the Specific Project.

8. ADDITION OF NEW PARTIES AND WITHDRAWALS

- 8.1 No new parties shall join the Specific Project unless with the unanimous agreement of all Parties and subject to conditions as the First Party may determine.
- 8.2 Any Party (the "Withdrawing Party") may withdraw from the Specific Project with the unanimous consent of the other Parties and subject to such conditions as the other Parties may unanimously decide.
- 8.3 In the event of withdrawal of a Party, such Withdrawing Party shall provide a replacement ("Replacing Party") to continue the Withdrawing Party's tasks, (unless otherwise decided by the other Parties). The Replacing Party shall be bound by the terms of this Agreement and such other conditions as the other Parties may unanimously determine.
- 8.4 To cater a vacant place of any Party, the remaining Parties will make all reasonable attempts to reallocate the obligations of such Withdrawing Party under this Agreement. In the event the Withdrawing Party should find a replacement but fails to do so, such Withdrawing Party may be required to pay a sum towards the cost of the Specific Project, the amount of which will be determined by the remaining Parties unanimously. Factors determining such sum may include (without limitation) the benefit accruing to such Withdrawing Party on joining the Specific Project.
- 8.5 In any case, the Withdrawing Party shall not be entitled to recover any of its costs incurred in connection with the Specific Project and shall comply with all conditions imposed pursuant to Clause 9.2 which shall include (without limitations):

- 8.5.1 rights granted to the other Parties in respect of the Withdrawing Party's Background IPR shall continue for the duration of the Specific Project; and
- 8.5.2 the Withdrawing Party shall grant to its Replacing Party or the remaining Parties, a non-exclusive, royalty-free license to use the Withdrawing Party's Resulting IPR for the purpose of carrying out the Specific Project until its completion; and
- 8.5.3 all rights acquired by the Withdrawing Party to the Background and Resulting IPR of other Parties' IPR shall cease immediately.

9. INTELLECTUAL PROPERTY RIGHTS

- 9.1 The protection of intellectual property rights shall be forced in conformity with the laws and regulations of Malaysia.
- 9.2 During the period of the Specific Project, each Party grants the other Parties a non-exclusive, royalty-free license to:
 - (a) use its Resulting IPR for their own internal research and development purposes but not for the purpose of commercial exploitation; and
 - (b) use its Background IPR for the purpose of undertaking the Project and to enable the use of Resulting IPR pursuant to Clause 9.2(a) but not for commercial exploitation.
- 9.3 Each Party shall promptly disclose in confidence to the other parties all Resulting IPR during the term of this Agreement and all Parties shall cooperate, where required, in relation to the preparation and prosecution of patent applications and any other Resulting IPR applications, and in relation to any legal proceedings concerning the same.
- 9.4 For clarity purposes, the proportion of any Resulting IPR will only be determined by the Parties after the completion of the Specific Project, taking into consideration the financial and technical contributions of the Parties concerned to the development of the respective Resulting IPR and the Parties will enter into a separate agreement pertaining the same.
- 9.5 Subject to Clause 9.4, nothing contained in this Agreement shall affect the absolute and unfettered right of each Party in all inventions, discoveries and intellectual property contained in its Background IPR.
- 9.6 The use of the name, logo and/or official emblem of any of the Parties as the case may be, on any publication, document and/or paper is prohibited without the prior written approval of the respective Party.

10. TERMINATION

10.1 Termination of funding

This Agreement shall terminate immediately with no liability between the Parties should the Main Project is terminated or the First Party is no longer to be a party to this Agreement or the Grant Agreement.

10.2 Termination by default

10.2.1 In addition to the remedies contained in Clause 8 (on withdrawal part); the non-defaulting Parties, after a two-thirds majority vote in favour of termination and via a written notice served on the defaulting Party, terminate such defaulting Party from the Specific Project, if the defaulting Party:

- (a) is in material breach of any of the terms of this Agreement and where the breach is capable of remedy, the defaulting Party fails to remedy such breach within thirty (30) days' service of a written notice specifying the breach and requiring it to be remedied; or
- (b) in the opinion of a majority of the other Parties, is incompetent, commits any act of gross or persistent misconduct and/or neglects or omits to perform any of its duties or obligations under this Agreement; or
- (c) fails or refuses after written warning from the First Party as the lead institution of the Specific Project to carry out the duties or obligations reasonably and properly required of it under this Agreement; or
- (d) becomes insolvent or is unable to pay its debt when due or admits in writing its inability to pay its debt;
- (e) enters any arrangement or composition with its creditors generally, or a receiver or manager is appointed; or
- (f) goes into liquidation or passed a resolution to go into liquidation, otherwise than for the purpose of reconstruction.

10.3 The termination of this Agreement, how so ever arising, is without prejudice to the right, duties, and liabilities of the Parties accrued prior to termination. The provisions in this Agreement which expressly or impliedly have effect after termination shall continue to be forceable notwithstanding termination.

11. CONFIDENTIALITY

11.1 For the purpose of this clause, " Confidential Information" shall mean all information of a commercially sensitive nature including but not limited to

specifications, drawings, circuit diagrams, tape, discs and other computer readable media, documents, techniques and know-how which are disclosed by one Party to the other for use in or connection with the Specific Project.

- 11.2 The Parties here to agree to use all reasonable endeavours to ensure that any Confidential Information disclosed or submitted in writing or any other tangible form to one Party ("Receiving Party") by the other ("Disclosing Party") shall be treated with the same care and discretion to avoid disclosure as the Receiving Party uses with its own similar information which it does not wish to disclose. Any information disclosed orally that is identified by the Disclosing Party as Confidential Information shall be treated the same as if it has been reduced to writing at the same time of disclosure to the Receiving Party.
- 11.3 The Receiving Party shall also, not during a period of seven (7) years after the termination of this Agreement, use any Confidential Information for any purpose other than the carrying out its obligations under this Agreement or other than in accordance with the terms of this Agreement.
- 11.4 A Party breaching the obligation of confidentiality maybe required by the other Parties to withdraw from the SpecificProject and will be subject to the conditions of Clauses 8 (on withdrawal).
- 11.5 Any proposed publications relating to Specific project shall first be reviewed by First Party.

12. NOTICES

- 12.1 All notices, reports,demandsandothercommunication which are required or may be given under this Agreement shall be in writing and shall be deemed to have been given if delivered personally, sent by registered mail or recorded delivery (full postage paid)or facsimile (followed by post)and addressed to:-

If to the First Party

Universiti Teknologi Malaysia

81310 UTM Skudai,

Johor Darul Ta'zim

Attention: Dr. Leow Pei Ling

Telephone: +607-5557170

Email:leowpl@utm.my

If to the Second Party

Universiti Malaysia Perlis,

01007 kangar, Perlis

Attention: Assoc. Prof. Ir. Dr. Mohd Hafiz Fazalul Rahiman
Telephone: +604-9885165
Email: hafiz@unimap.edu.my

If to the Third Party

Universiti Tun Hussein Onn Malaysia,
86400 Parit Raja,
Johor Darul Ta'zim
Attention: Dr. Elmy Johana Mohamad
Telephone: +6019-7507576
Email: elmy@uthm.edu.my

If to the Fourth Party

Universiti Malaysia Pahang,
26600 Pekan, Pahang
Attention: Dr. Yasmin Abdul Wahab
Telephone: +609-4246121
Email: yasmin@ump.edu.my

- 12.2 Any notices given shall be deemed to have been received on the first working day following the day such notice was sent save that notice sent by personal delivery shall be deemed received when delivered.

13. ASSIGNMENT

Party shall not assign any of its rights under this Agreement to any other or third party without the prior written consent of the other Parties.

14. NO PARTNERSHIP

- 14.1 Nothing contained herein is to be construed so as to constitute a joint venture partnership or formal business organisation of any kind among other Parties or so to constitute either Party as the agent of the other Party.
- 14.2 Understood and agreed that nothing in this Agreement shall oblige either Party to enter into any further agreement(s) or other activities relating to the Agreement between the Parties.

15. ENTIRE AGREEMENT

This Agreement embodies and sets forth the entire agreement and understanding of the Parties and supersedes all prior oral or written agreements, understandings or arrangements relating to the subject matter of this Agreement. Neither Party shall be entitled to rely on any agreement, understanding or arrangement which is not expressly set forth in this Agreement other than written agreements entered into after the date hereof.

16. SEVERABILITY

If any the provision or term of this Agreement or any part there of shall become or be declared illegal, invalid or unenforceable for any reason whatsoever including but without limitation by reason of the provisions of any legislation or other provision having the force of law or by the decision of any court or other body of authority having jurisdiction over the Parties or this Agreement such terms or provisions shall be divisible from this Agreement in the jurisdiction in question provided always that, if such deletion substantially affects or alters the commercial basis of this Agreement, the Parties shall negotiate in good faith to amend and modify the provisions and terms of this Agreement as may be necessary or desirable in the circumstances.

17. FORCE MAJEURE

- 17.1 If by any reason of any event of force majeure either of the Parties shall be delayed in, prevented from performing any of the provision of this Agreement except for payment of money due, then, such delay or non-performance shall not be deemed to be a breach of this Agreement and no loss or damage shall be claimed by either Party from the other Party by reason hereof.
- 17.2 In the event the exercise of the rights and obligations under this Agreement be materially hampered, interrupted or interfered with by reason of any event of force majeure, then the obligations of the interruption shall be postponed for a period of time equivalent to the period or periods of suspension, and the Parties shall use their best endeavours to minimise and reduce any period of suspension occasioned by any of the event aforesaid.
- 17.3 If either Party considers an event of force majeure to be of such severity or to be continuing for a period of more than sixty (60) continuous days that if effectively frustrates the original intention of this Agreement, then, the Parties may agree that this Agreement may be terminated upon mutual agreement of the Parties.
- 17.4 The expression 'an event of force majeure' shall mean and include fire, flood, casualty, lockout, strike, labour disputes, industrial action of any kind, unavoidable accident, breakdown of equipment, national calamity of riot, Act of God, the enactment of any Act of Parliament or the act of any other legally constituted authority, any cause or event arising out or is attributable to war, or

any other cause or event (whether of a similar or dissimilar nature) outside the control of the Parties other than the shortage or lack of money.

18. SETTLEMENT OF DISPUTE

18.1 If any controversy, claim or dispute arises out of or in relation to this Agreement (including any question regarding its existence, validity or termination) or with respect to any breach thereof, the Parties shall seek to resolve the matter amicably through discussions between the Parties.

18.2 If the Parties fail to resolve such controversy, claim dispute or breach within twenty one (21) days from referral of the controversy, claim or dispute for resolution by amicable arrangement and compromise, then either Party may seek resolution of the same by way of initiating legal action in the Courts of Malaysia.

19. AMENDMENT

This Agreement shall not be amended, modified, varied or supplemented except in writing and signed by duly authorised representatives of the Parties.

20. WAIVER

No failure or delay on the part of the Parties to exercise any right or remedy under this Agreement shall be construed or operated as a waiver thereof nor shall any single or partial exercise of any of this right or remedy be construed as a waiver of any other, rights or remedies of the Parties hereunder or the law.

21. COSTS

All costs, legal fees and other expenses incurred in the preparation of this Agreement shall be borne by each Party.

22. GOVERNING LAW

This Agreement shall be governed and construed in accordance with the laws of Malaysia.

23. SUCCESSORS BOUND

This Agreement shall be binding on each Party's respective successors and permitted assigns.

(The remainder of this page is intentionally left blank]

IN WITNESS WHERE OF the Parties have hereunto set their hands the day and year first above written.

FOR AND ON BEHALF OF
UNIVERSITI TEKNOLOGI MALAYSIA

.....
Deputy Vice-Chancellor (Development)
Prof. Dr. Azlan bin Ab. Rahman

In the presence of:-

.....
.....

FOR AND ON BEHALF OF
UNIVERSITI MALAYSIA PERLIS

.....
Vice Chancellor
Dato' Prof. Dr. Zul Azhar Zahid Jamal

In the presence of:-

.....
.....

FOR AND ON BEHALF OF
UNIVERSITI TUN HUSSEIN ONN MALAYSIA

.....
Vice Chancellor
Prof. Ts. Dr. Wahid bin Razzaly

In the presence of:-

.....
.....

FOR AND ON BEHALF OF
UNIVERSITI MALAYSIA PAHANG

.....
Vice Chancellor
Prof. Dato' Sri Ts. Dr. Daing Nasir Ibrahim

In the presence of:-

.....
.....

APPENDIX 1

Team Members

From the First Party:

- 1) Dr. Leow Pei Ling (UTM)
- 2) Assoc. Prof. Ir. Dr. Herlina Abdul Rahim (UTM)
- 3) Assoc. Prof. Ir. Dr. Mohamed Sultan Mohamed Ali (UTM)
- 4) Dr. Yusri Yunos (UTM)
- 5) Dr. Fauzan Khairi Che Harun (UTM)

From the second Party:

- 1) Assoc. Prof. Ir. Dr. Mohd Hafiz Fazalul Rahiman (UniMAP)
- 2) Dr. Zulkarnay Zakaria (UniMAP)
- 3) Madam Masturah Tunnur Mohamad Talib (UniMAP)
- 4) Dr. Jaysuman Pusppanathan (UTM)
- 5) Assoc. Prof. Dr. Sallehuddin Ibrahim (UTM)

From the Third Party:

- 1) Dr. Elmy Johana Mohamad (UTHM)
- 2) Prof. Dr. Ruzairi bin Abdul Rahim (UTHM)
- 3) Assoc. Prof. Dr. Siti Zarina binti Mohd Muji (UTHM)
- 4) Mr. Mohd Fadzli bin Abd Shaib (UTHM)
- 5) Dr. Anita Ahmad (UTM)
- 6) Dr. Khairul Hamimah Abas(UTM)

From the Fourth Party:

- 1) Dr. Yasmin Binti Abdul Wahab (UMP)
- 2) Dr. Mohd Anwar bin Zawawi (UMP)
- 3) Dr. Mohd Mawardi bin Saari (UMP)
- 4) Dr. Zainah binti Md. Zain (UMP)
- 5) Dr. Rashidah Arsat (UTM)
- 6) Madam Shahrulnizahani Mohammad Din (UTM)

APPENDIX 2

PIC	NO	DESCRIPTION	18	18	18	18	18	18	19	19	19	19	19	19	19	19	19	20	20	20	20	20	20	20	20
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Project 1 (UTM)	1	Conceptual design of microchannel and planar electrodes	█	█	█			i																	
	2	Development and fabrication of Tomography LOC device				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
	3	Device testing																							
	4	Device assembly and integration																							
	5	Device characterization and evaluation																							
	6	Meeting/ Report/ Documentation	█				█				█				█				█				█		█
Project 2 (UniMAP)	1	Study and Understanding Overall Project Design Concept	█	█	█																				
	2	Design and development of Control unit			█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
	3	Development of Data acquisition system																							
	4	Systems assembly and integration																							
	5	Test and Debug																							
	6	System Evaluation																							
Project 3 (UTHM)	1	Study of Overall tomography LOC design concept	█	█	█																				
	2	Signal Conditioning and Processing				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
	3	Image Reconstruction Algorithm																							
	4	Caliration, test and tuning																							
	5	Systems assembly and integration																							
	6	Image reconstruction Evaluation																							
Project 4 (UMP)	1	Study of Overall tomography LOC design concept	█	█																					
	2	Modelling and Simulation (sensors and device)																							
	3	Experimental measurement (Tomography LOC sensor array)																							
	4	Systems assembly and integration																							
	5	Test and Debug																							
	6	Device characterization and evaluation																							

	Milestone	Date
i	Completion of LOC and Planar Sensor Array Design	Apr-19
ii	Completion of LOC and Planar Sensor Fabrication	Sep-19
iii	Completion of Control Unit, DAQ system and Image Reconstruction Algorithm	Nov-19
iv	Completion of tomography LOC system integration	Mar-20
v	Completion of device characterization and evaluation	Aug-20

APPENDIX 3

- 3.1 Project Disbursement Timeline from Second Party to the First Party
15 April 2018

- 3.2 Project Disbursement Timeline from Third Party to the First Party
15 April 2018

- 3.3 Project Disbursement Timeline from Fourth Party to the First Party
15 April 2018

- 3.4 Project Disbursement Timeline from First Party to the Second Party
After 3.1 in Appendix 3

- 3.5 Project Disbursement Timeline from First Party to the Third Party
After 3.1 in Appendix 3

- 3.6 Project Disbursement Timeline from First Party to the Fourth Party
After 3.1 in Appendix 3