# **International Joint R&D Program Agreement**

과제명 Project	Neural Architecture Search (NAS)와 TinyML 기반 리튬이온 배터리 잔여수명 예측 및 상태진단 연구 Remaining Useful Life Estimation and State Diagnosis of Lithium-Ion Battery using Neural Architecture Search (NAS) and TinyML			
총 수행기간 Total Project Period	2024년 05월 01일부터 2027년 04월 30일까지 (36개월) From 05/01/2024 until 04/30/2027 (36 months)			
협약내용 Agreement	1차년도 (Year 1)	2차년도 (Year 2)	3차년도 (Year 3)	합계 (Sum)
연차별 수행기간 Project Period	05/01/2024 ~ 04/30/2025	05/01/2025 ~ 04/30/2026	05/01/2026 ~ 04/30/2027	05/01/2024 ~ 04/30/2027
총괄책임자 Lead Organization Principal Investigator	성명 Lim, Wansu 직위 Professor 소속기관 Sungkyunkwan University			
해외참여기관책임자 Participating Organization Principal Investigator	성명 Lee, Chul-Ho 직위 Assistant Professor 소속기관 Texas State University			
계약대상자 Parties to	(갈) Sungkyunkwan University (Party A) Representative of Lead Organization			
Agreement	(을) Texas State University (Party B) Representative of Participating Organization			

WHEREAS, this Agreement prescribes all matters regarding the performance of the International Joint R&D Program between Sungkyunkwan University, a private university, located at 2066, Seobu-ro, Jangan-gu, Suwon-si, Gyeonggi-do, 16419 Korea, (hereinafter referred to as "Party A") and Texas State University, a public institution of higher education, located at 601 University Dr., San Marcos, Texas, 78666 USA, (hereinafter referred to as "Party B"). Party A and Party B are hereinafter collectively referred to as the "Parties" and individually as a "Party"; and

WHEREAS, the Parties acknowledge and agree that the Project (defined below)

is a national research and development project funded by the government of Korea. The Parties also acknowledge that the Project and the Parties' performance under this Agreement will be subject to the management and supervision of the government of Korea and the National Research Foundation of Korea ("NRF"), which is an institution designated for the Project by the Korean government.

# **Article 1 (Purpose and Terms of Agreement)**

- (1) The purpose and the terms of this Agreement is based on the purpose and the contents of the proposal titled, "Research on Battery Remaining Life Prediction and State Diagnosis Technology for E-Mobility Embedded Systems", attached hereto as Attachment 1 (hereinafter referred to as the "Scope of Work").
- (2) This Agreement sets forth the purpose, scope, and the contents of the Project specified in the Scope of Work.

# **Article 2 (Definition of Terms)**

- (1) "Project" refers to all activities necessary concerning the Scope of Work.
- (2) "Results" refers to technologies developed from this Project, and parts of or the entirety of the original, reproduced, or a copied version of all technological data or documents that have been produced as a result of this Project such as Intellectual Property Rights, specific materials, research data and program, Know-How, and the Project report.
- (3) "Know-How" refers to the technology, method, invention, process and program that has economic value by itself and is not generally well-known, among the data that Party A and Party B have provided to each other or technological information that has been obtained as a result of the Project.
- (4) "Project Intellectual Property" refers to the legal rights relating to inventions, patent applications, patents, copyrights, trademarks, mask works, and computer software, first made or generated in the performance of the Project.
- (5) "Material Transfer" refers to the provision of the material, derivatives, samples, and tangible material related to these that have been obtained from the Project to a

third party or the other party.

- (6) "Non-exclusive License" refers to a Party's right to utilize the Results non-exclusively.
  - (7) "Exclusive License" refers to a Party's right to utilize the Results exclusively.
- (8) "Stage Evaluation" refers to the evaluation process to determine whether or not to continue to support the Project after reviewing and evaluating the report submitted for the Corresponding Year.
- (9) "Progress Inspection" refers to the procedures implemented to check the progress of the Project.
- (10) "Final Evaluation" refers to the evaluation procedures carried out to review and evaluate the final report on the progress and the Results of the Project during the entire Project Period, to determine whether the Project is successful or not.
- (11) "Project Period" refers to the period from the first day of the Project to its completion.
- (12) "Corresponding Year" refers to each Project period specified in Clause (1) of Article 3.
- (13) "Lead Organization" refers to the organization (including firms) that leads the Project.
- (14) "Participating Organization" refers to the organization (including firms) that participates in the Project in cooperation with the Lead Organization.
- (15) "Budget" refers to the expense used in carrying out the Project, and to the total amount of contribution, Matching Contribution in cash and In-Kind.
- (16) "Contribution" refers to the expense provided by the government from its finances or funds to accomplish the purpose of the Project.
- (17) "Matching Contribution" refers to the amount in cash or In-Kind contributed by the Lead Organization or the Participating Organization, excluding the Contribution from the Budget.
- (18) "In-Kind" refers to the Matching Contribution, such as personnel and staff, equipment and research facility, material, land, building, etc. held by the Lead Organization or the Participating Organization contributed to the Project.
  - (19) "Overhead Cost" refers to the amount among the Budget expended to

support personnel and staff, research, and outcome usage, to the extent it meets the standard specified by the Korean government.

- (20) "Direct Cost" refers to the amount among the Budget expended for matters directly related to the Project, such as labor, research equipment and facility, material, etc., to the extent it meets the standard specified by the Korean government.
- (21) "Settlement" refers to all acts of auditing to determine the appropriateness of Budget usage and expenditure during the Corresponding Year of the Project.
- (22) "Carry-over" refers to the Budget for the Corresponding Year to be carried over inevitably to the next year with approval of NRF.
  - (23) "Settled Amount" refers to the sum of the balance from the Budget.

# **Article 3 (Project Period)**

(1) The Project Period is from 05/01/2024 to 04/30/2027, and each Corresponding Year of the Project Period is as follows:

Year 1: 05/01/2024 ~ 04/30/2025

Year 2: 05/01/2025 ~ 04/30/2026

Year 3: 05/01/2026 ~ 04/30/2027

(2) The Project Period set forth in Clause (1) above may be modified by a written agreement between Party A and Party B, subject to the prior approval of NRF.

# **Article 4 (Payment of the Budget)**

- (1) The Budget shall be  $\forall 150,000,000$  and shall be paid on a fixed price basis.
- (2) Party A shall wire transfer the Budget specified in the above Clause (1) to Party B's account as follows:

Classification (Phase)	Date of Doument of Dudget	Budget	
Classification (Phase)	Date of Payment of Budget	Cash	In-Kind
Year 1	02/10/2025	₩50,000,000	-
Year 2	05/10/2025	₩50,000,000	-
Year 3	05/10/2026	₩50,000,000	-

- (3) In case of the following circumstances, the time and the amount of payment may be adjusted, notwithstanding Clause (1) and (2) above.
- A. In case the Budget is adjusted due to changes of policy or budget of the Korean government;
- B. In case an adjustment of the Budget is necessary due to a change of the purpose, content or Project Period of the Project;
- C. In case an adjustment is necessary due to a change or termination of the Agreement; or
- D. In case an adjustment of the Project Plan or the Budget is necessary according to the inspection and evaluation with respect to the Project carried out by NRF.
- (4) Party B shall manage the Budget provided by Party A or a higher organization of Party A transparently in a separate account or under a different account heading.
- (5) Party A and Party B agree not to make a claim against the other for any losses arising from foreign exchange rate fluctuations. Unless otherwise agreed between Party A and Party B, the exchange rate shall be based on the cash sales rate at the time of remittance by Party A to Party B. Party A shall pay any resulting bank transfer fees and shall not deduct such fees from the Budget payable to Party B.
- (6) Overhead Cost among research expense provided by Party A to Party B shall be settled within 15% of the Direct Cost (excluding In-kind).

# Article 5 (Facility, Equipment, Participating Personnel)

- (1) Purchase of capital equipment \$\text{\psi}30,000,000\$ or above requires prior authorization of Party A.
- (2) The Project shall be implemented by Party B and the researchers from organizations designated by Party B. Party B shall take full responsibility and authority in securing the personnel and facilities required in carrying out the Scope of Work.

#### **Article 6 (Performance of the Project)**

(1) Party B shall diligently perform the Project tasks in accordance with the Scope

of Work in Attachment 1. Changes to the Scope of Work require prior approval from Party A.

- (2) Party A and Party B shall hold interim inspection meetings once every quarter or once every year during the Project Period to check the progress of the Project.
- (3) Party B shall submit interim reports for each Corresponding Year after the end of each Corresponding Year of the Project Period and a final report to Party A after the end of the Project Period.
- (4) The Parties may meet, virtually or in person, as needed to discuss the progress of the project and to perform testing of the work results.
- (5) Party A shall carry out management tasks concerning the Project executed by Party B such as progress inspection, interim evaluation (Stage Evaluation), onsite management inspection, and final evaluation.

# **Article 7 (Information Exchange)**

- (1) Each Party may request information necessary for the smooth performance of the Project, and as long as such request is relevant to the Project, the other Party shall provide such information.
- (2) In case any right of a third party hinders the Parties' utilization of the Results, the affected Party shall promptly report such matter to the other Party.
- (3) The scope, place, time, method and other matters regarding the exchange of information pursuant to Clause (1) above shall be decided in accordance with discussion between the Parties.

#### **Article 8 (Reporting the Results and Settlement of the Budget)**

- (1) Party B shall submit an interim report to Party A in written form as agreed by both Parties 45 days prior to the last day of each phase.
- (2) Party B shall submit a final report to Party A in written form as agreed by both Parties within thirty (30) calendar days of the end of the Project Period.
- (3) Party B may report expenditures and remaining funding balances in U.S. Dollars. All financial reports shall be certified by Party B's financial officer. Financial reports shall be submitted on an annual basis and state the funds spent and the funds

remaining to be carried into the next year. The format may be in a letter signed and certified correct by Party B's financial officer.

# **Article 9 (Confirmation of the Result)**

- (1) Party A shall review the final progress reports submitted by Party B and shall notify Party B of any deficiencies. If there are no corrections required, Party A will notify Party B that the final reports have been accepted and approved.
- (2) Party B shall not knowingly infringe on the intellectual property rights of any third parties in the conduct of the Project. Should any infringement be identified, Part B shall work diligently with Party A to correct and resolve any such infringement.

# Article 10 (Background IP)

- (1) "Background Intellectual Property (BIP)" means property and the legal right therein of either or both Parties developed before or independent of this Agreement including inventions, patent applications, patents, copyrights, trademarks, mask works, trade secrets and any information embodying proprietary data such as technical data and computer software.
- (2) If one or both Parties own or otherwise control Background Intellectual Property that is necessary for the commercialization of the Results, the Parties agree that to the extent they have the right to do so, each will extend to the other an opportunity to negotiate, in good faith and on terms that are fair and reasonable, license rights to Background Intellectual Property to the extent such background license rights are necessary to the commercialization of the Results. Background Intellectual Property rights are "necessary" if there is no reasonable alternative to achieve the equivalent function of the Background Intellectual Property and if utilization of such Background Intellectual Property would be infringing if licenses were not granted. In the case of Background Intellectual Property of Party B this Clause (2) shall apply only to that intellectual property, which has been developed, in whole or in part, by Party B's Principal Investigator and other Party B faculty, graduate students and staff participating in the Project.

# **Article 11 (Invention Related to Duty)**

- (1) Both Parties shall adopt and implement employment regulations related to the ownership of inventions created by their respective employees.
- (2) The Parties shall notify their researchers of the intellectual property ownership policies related to employment in a written form in accordance with the employment regulation provided in Clause (1) above with respect to the Results after completion of the Project under this Agreement.

# Article 12 (Ownership of the Results, Tangible Property and Intellectual Property)

- (1) The ownership of tangible property such as research equipment, facilities and trial products produced, obtained or purchased during the performance of the Project shall be owned by the Party who has obtained or purchased such tangible property.
  - (2) Invention Ownership

Unless otherwise agreed in writing, Project Intellectual Property shall be owned by the Party whose employees make or generate the Project Intellectual Property.

- (a) Any invention or other intellectual property made or developed jointly during the performance of this Agreement will be jointly owned by the employers of the inventors, for which purpose only, students of Party B will be treated as if they were employees of Party B.
- (b) Jointly made or generated Project Intellectual Property shall be jointly owned. Party B shall have the first option to perfect the rights in jointly made or generated Project Intellectual Property, provided that any patent filing or copyright registration shall be made in the name of both Party B and Party A. In the event a Party elects not to perfect the rights in joint Project Intellectual Property, the other Party shall thereafter have the right to do so.
- (c) The Parties agree to execute a Joint Intellectual Property Management Agreement at the time of disclosure. The agreement shall, at a minimum, contain communications strategies, designate one Party as lead in commercialization efforts of the Joint Intellectual Property, and contain a revenue and cost-sharing plan.

- (d) The Parties agree to disclose to each other, in writing, each and every Project Intellectual Property, which may be patentable or otherwise protectable under the United States patent laws in Title 35, United States Code or the laws of the Republic of Korea. The Parties acknowledge that they will disclose Project Intellectual Property to each other within two months after their respective inventor(s) inventors first disclose the invention in writing to the person(s) persons responsible for patent matters of the disclosing Party. All written disclosures of such inventions shall contain sufficient detail of the invention, identification of any statutory bars, and shall be marked confidential.
- (3) Unless otherwise provided in this Agreement, the tangible or intangible Results owned by each Party in accordance with Clause (1) and (2) above may not be disposed of or transferred at either Party's discretion during the Project Period.

# **Article 13 (License of Intellectual Property Rights and Profit Distribution)**

(1) Option to License

Party A will have an option to license the Project Intellectual Property of Party B subject to any third party rights, as follows:

- (a) Party A shall have an exclusive option to license Party B Project Intellectual Property for an option period of 3 months after such Property has been reported to Party A. The option period may be extended for another 3 months by giving written notice to Party B prior to the expiration date of the initial option period.
- (b) During the option period Party A may request, in writing, and at Party A's expense, that Party B pursue and maintain patent protection for Party B owned Project Intellectual property. Party A shall reimburse patent expenses and legal fees within 60 days of receipt of an invoice from Party B.
- (c) Party A may terminate the option period by providing Party B thirty (30) calendar days written notice. Upon receipt of such notice, Party B may, at its sole discretion, discontinue pursuit of option-related patents and shall promptly invoice Party A for expenses to the date of termination. Party A shall reimburse patent expenses and legal fees within 60 days of receipt of an invoice from Party B. No further costs may be charged to the Party A from the date of termination.

- (d) Party B may terminate the option period upon failure of Party A to reimburse patent and legal expenses.
- (e) At any time prior to the expiration date of the option period, the Parties agree to promptly enter into good faith negotiations for a License Agreement under Party B's patent rights. The specific terms of the license will be determined during the negotiations process but shall, at a minimum, include payment terms, reimbursement of Party B's patent and legal expenses incurred in seeking and maintaining patent protection. And, in the case of an exclusive license, reasonable milestones and minimum royalties shall be included.
- (f) If the Party B's Intellectual Property is other than a patentable invention, Party B shall grant to Party A the same option terms outlined in Clause (1) of this Article.
- (g) Copyright Ownership and Licenses. Party B will own the title to any copyrightable material first produced under this Agreement by its faculty, staff, or students. However, Party B will grant to Party A an irrevocable, royalty free, non-transferable, non-exclusive right and license to use, reproduce, display, distribute, and perform all such copyrightable materials other than computer software and its documentation.
  - (1) Party B will grant to Party A an irrevocable, royalty free, non-transferable, non-exclusive right and license to use, reproduce, display, distribute, and perform computer software and its documentation specified to be developed and delivered under this Agreement for Party A's internal purposes.
  - (2) Party A may negotiate a non-exclusive (or exclusive, if Party B deems it appropriate) royalty bearing license to use, reproduce, display, distribute, and perform such computer software and its documentation for commercial purposes.
- (h) Tangible Research Property. If Party B elects to establish property rights other than patents to any tangible research property (such as biological materials) developed during the course of the research, Party B and Party A will determine the disposition of rights to such property by a separate agreement. Party B will, at a minimum, reserve the right to use and distribute tangible research property for research purposes.
  - (i) License Effective Date. All licenses elected by Party A under this Article will

become effective as of the date that the Parties sign a subsequent license agreement.

(j) NRF Project Intellectual Property rights. The Parties hereby confirm that the Project is funded by NRF. NRF shall be granted any intellectual property rights required under applicable national law, policy and regulation.

#### (2) Follow-on Research or Development

All follow-on work, including any licenses, contracts, subcontracts, sublicenses or arrangements of any type, shall contain appropriate provisions to implement the Project Intellectual Property rights provisions of this Agreement and ensure that the Parties obtain and retain such rights granted herein in all future resulting research, development, or commercialization work.

(3) (Material Transfer) When either of Party A or Party B unilaterally transfers material to a third party, prior approval from the other Party is not necessary. However, the Party shall send a copy of the contract containing the contents and the scope of the Material Transfer. In this case, the Party that makes profit from the Material Transfer to a third party shall distribute a certain amount of the profit to the other Party to be negotiated under a separate agreement.

## **Article 14 (Publication of the Results)**

(1) Party A and Party B shall jointly decide the time, contents, and method of announcing or publishing the progress or the Results of the Project. However, in case of publishing the contents in a research report or a journal, it shall be specified that the Project and the Results were funded by NRF as follows:

"This research was supported by the National Research Foundation of Korea (NRF)."

(2) The free dissemination of information is an essential and long-standing policy of Party B. However, under exceptional circumstances, Party B recognizes that it may properly hold in confidence data supplied by Party A which Party B considers essential for the conduct of the Project. Accordingly, Party B's acceptance and use of any proprietary data which may be supplied by Party A in the course of the Project shall be subject to the following: The data must be marked or designated in

writing as proprietary to Party A. Access to proprietary data shall not be a condition precedent to meaningful participation by students at Party B.

(3) Subject to the terms of Clause (2) above, either Party may publish its results from the Project. However, the publishing Party shall provide the other Party a thirty (30) calendar-day period in which to review proposed publications, identify proprietary or confidential and patentable information, and to submit comments. The publishing Party shall not publish or otherwise disclose proprietary or confidential information identified by the other Party and the publishing Party will give full consideration to all comments before publication. Furthermore, upon request of the reviewing Party, publication will be deferred for up to sixty (60) additional days for preparation and filing of a patent application which the reviewing Party has the right to file or to have filed at its request by the publishing Party.

# **Article 15 (Liability)**

- (1) This indemnity provision applies to Party B only to the extent permitted by Texas law. Party B does not waive any of its defenses, including the defense of governmental immunity.
- (2) Each Party disclaims all warranties running to the other or through the other to third parties, whether express or implied, including without limitation warranties of merchantability, fitness for a particular purpose, and freedom from infringement, as to any information, result, design, prototype, product or process deriving directly or indirectly and in whole or part from such Party in connection with the Project.
- (3) Party A will indemnify and hold harmless Party B with regard to any claims arising in connection with commercialization of the Results by or under the authority of Party B.

#### **Article 16 (Use of Names)**

Neither Party will use the name of the other in any advertising or other form of publicity without the written permission of the other.

Texas State # 25-JMP-SRA-12192024

# **Article 17 (Notices)**

Any required notices under this Agreement shall be in writing delivered by certified or registered mail addressed to the Parties as follows:

Party B PI

Name: Dr. Chul-Ho Lee

Address: Texas State University, Department of Computer Science

601 University Dr., CMAL 311G,

San Marcos, Texas 78666 USA

Phone: +1 512-245-3409

Email: chulho.lee@txstate.edu

# With copy to:

Marivel Alvarez

Senior Director, Office of Sponsored Programs

601 University Dr., JCK 420

San Marcos, TX 78666

Phone: +1 512-245-2102

E-Mail: grants@txstate.edu

Party A PI

Name: Dr. Wansu Lim

Address: 2066, Seobu-ro, Jangan-gu, Suwon-si, Gyeonggi-do, 16419 Korea

Texas State # 25-JMP-SRA-12192024

Phone: +82 31-299-4606

Email: wansu.lim@skku.edu

If notices, statements and payments required under this Agreement are sent

by certified or registered mail by one Party to the other Party at its above address, they

shall be deemed to have been given or made as of the date shown on the

acknowledgement of receipt.

Article 18 (Amendment)

In case a material change occurs regarding the terms and conditions of this

Agreement, the terms may be amended with the written consent of both Parties.

**Article 19 (Assignment)** 

Neither Party shall transfer the status as a party to this Agreement to any third

party without the written consent of the other Party, nor transfer this Agreement or all

or any part of its rights and obligations specified in this Agreement to a third party.

**Article 20 (Principle of Good Faith)** 

The Parties shall diligently perform the Project in good faith.

**Article 21 (Force Majeure)** 

The Parties shall not be responsible for any loss arising from force majeure events

such as riot, rebellion, war, natural calamity, or other events beyond the reasonable

control of such Party in performing the Project.

**Article 22 (Termination)** 

(1) Party A or Party B may immediately terminate this Agreement in the event the

other Party has conducted any of the following and fails to remedy such breach after

being notified of the breach or shows no intention of remedying such breach.

A. In case of failing to cooperate with performing the Project for no reasonable

14

#### cause

- B. In case of committing illegal or unjust acts in performing this Agreement
- C. In case of a material breach of this Agreement which renders the continued performance of the Project impossible
- (2) In case this Agreement is terminated in accordance with Clause (1) of this Article, Party B shall submit a detailed report on the expenditure of the Budget and the research report within 30 days of such termination, and carry out settlement and return any unexpended balance of the Budget to Party A as separately agreed by the Parties.

# **Article 23 (Interpretation & Dispute Resolution)**

- (1) This Agreement shall be executed in English, and in the event of any discrepancy difference or conflict over interpretation thereof, the English language shall precede.
- (2) Any dispute relating to or arising from matters not provided herein shall be resolved through consultations between the Parties to the dispute. Should the Parties fail to resolve the dispute, the Parties may use any legal remedies available to them. Each Party shall bear their own expenses related to dispute resolution.

#### Article 24 (Default and Breach)

Failure by any Party to meet their obligations under this Agreement may be determined to be a breach of contract. If a Party determines that the other Party is in default of any term, that Party shall deliver written notice to the other Party to the contacts listed in Article 17 (Notices). The defaulting Party shall then have thirty (30) days to cure the breach. If the Parties are unable to reach an agreement regarding cure, the Agreement shall be terminated in accordance with Article 22 (Termination). In the event of termination for cause, all Option Rights described in Article 13 (License of Intellectual Property Rights and Profit Distribution) shall be null and void.

### **Article 25 (Survivorship)**

The provisions of Articles 10, 11, 12, 13, 14,15,16,19 and 24 shall survive any expiration or termination of this Agreement.

# **Article 26 (Export Control)**

The Parties agree to comply with U.S. export control regulations. If a Party desires to disclose to the other Party, whether directly or indirectly, any information, technology or data that is identified on any U.S. export control list, including the Commerce Control List of 15 C.F.R. Part 774 and the U.S. Munitions List of 22 C.F.R. 121, the disclosing Party will advise the receiving Party at the time of disclosure and the receiving Party will advise the disclosing Party if it desires to take receipt of the export-controlled materials. No information subject to export controls may be provided to another party hereto without the written consent of the receiving Party's Notice Contact.

## **Article 27 (Effectiveness)**

This Agreement shall become effective from the date of signing and sealing by both Parties, and shall expire on the last day of the Project Period specified in Article 3.

IN WITNESS WHEREOF, Party A and Party B have caused this Agreement to be executed in duplicate originals by their duly authorized representatives and each Party retains each signed original.

For Party A

Sungkyunkwan University

2066, Seobu-ro, Jangan-gu, Suwon-si, Gyeonggi-do, 16419 Korea

Principal Investigator

이 보는 수(Signature) 2066, Seobu-ro, Jangan-gu, Suwon-si, Gyeonggi-do, 16419 Korea

For Party B

Texas State University

Glove Roday (Signature)

Vice President for Research

601 University Drive, San Marcos, Texas 78666, USA

Principal Investigator

Chul-Ho Lee (Signature)

601 University Drive, San Marcos, Texas 78666, USA

# ATTACHMENT 1 Scope of Work

The work to be performed by Texas State University, whose efforts are led by Dr. Chul-Ho Lee, is to conduct research on deep learning and data processing for embedded systems with the following specific research tasks:

- Year 1: Research on optimizing deep learning for low-end embedded systems
- Year 2: Research on debugging techniques for embedded systems
- Year 3: Research on accelerating data processing for mobile embedded systems