**Ant Industry-Academia Research Agreement**

Party A: \*\*\*\*\*\*

Unified Social Credit Code: \*\*\*\*\*\*

Address: \*\*\*\*\*\*

Contact Person: \*\*\*\*

Email: \*\*\*\*\*\*\*\*\*

Party B: Macquarie University (Australia)

Address: 4 Research Park Drive, Macquarie University, NSW 2109, Australia

Contact Person: Dr. James Xi Zheng

Email: [james.zheng@mq.edu.au](mailto:james.zheng@mq.edu.au)

Whereas Party B possesses advanced skills, knowledge, specialized expertise, and resources in the field of "Software Engineering" and related areas;

Whereas Party A wishes to engage Party B to carry out a research and development project on "System Software Vulnerability Discovery and Localization" (hereinafter referred to as the "R&D Project");

In light of this, Party A and Party B, after friendly negotiation, have reached the following agreement regarding the matters related to the R&D Project, to be jointly observed:

**Article 1. Definitions**

The terms used in this agreement shall have the following meanings as stated below:

1. "Background Intellectual Property": The intellectual property rights owned or obtained by a party prior to the execution of this agreement, which are relevant to the research and development project conducted under this agreement.

2. "Research and Development Project Domain": The field of research, development, and related work pertaining to the research and development project.

3. "Foreground Intellectual Property": Any and all inventions, devices, processes (including but not limited to steps of using or manufacturing such devices), methods, compositions, results, software, and related technical know-how, whether or not patentable, developed independently or jointly by Party A and Party B during the term of this agreement and within 90 days after its termination or expiration, within the research and development project domain.

4. "PI (Principal Investigator)": Refers to the designated project leader appointed by Party B for this research and development project, specifically Dr. James Xi Zheng, Director of the Intelligent Systems Research Group at Macquarie University. Contact number: +61 431 044 581; Email: james.zheng@mq.edu.au.

5. "Confidential Information": Refers to all technical and non-technical information (including but not limited to data, documents, plans, source code, software, hardware, technical specifications, proprietary formulas, algorithms, programs, and other trade secrets and information) disclosed by one party to the other, or acquired or accessed by one party from the other, including all outcomes resulting from this agreement, whether disclosed orally or in writing. Tangible **confidential information** shall be marked as "Confidential" or "Proprietary." Intangible **confidential information** shall be designated as "**Confidential Information**" at the time of disclosure and confirmed in writing within 30 days after disclosure.

**Article 2. Development Content**

1. Upon the effectiveness of this agreement, Party B shall, according to the needs of the research and development project, assign a suitable and sufficient number of research and development personnel to form a project team that will be responsible for the specific development of the project. Party B shall provide Party A with the list of project team members and relevant information. The project team shall commence work upon confirmation by Party A. If any adjustments to the team members are required during the development process, Party B shall obtain prior approval from Party A. Party B shall ensure that all project team members are employees of Party B or enrolled students, and shall ensure that these individuals have a clear understanding of and agree to be bound by the terms of this agreement, particularly with regard to intellectual property rights and confidentiality. The project team shall be led by the PI.

2. Party A and Party B shall implement the research and development project in a timely and high-quality manner, in accordance with the mutually confirmed "Research and Development Project Description" (as detailed in Annex 1 of this agreement). The research and development project description shall provide a detailed description of the content of the project, the members of the project teams from both parties, the allocation of research resources, the implementation plan, milestone achievements, acceptance criteria, and other relevant details. Both parties have the right to mutually adjust the scope of the research and development project through consultation, but such adjustments shall be documented in writing. Party A has the right to supervise and inspect the project's execution based on the research and development project description and, based on the results of such supervision and inspection, may request Party B to adjust the project timeline or replace research and development personnel.

3. The main responsibility of Party B's project team is to utilize Party B's academic resources and facilities to carry out the research and development project. Party A will provide certain resources to Party B based on the project's needs, such as access to research-related materials, facilities, and equipment provided by Party A (Party B shall not utilize Party A's resources for activities outside the research scope defined in Annex 1 of this agreement) for scientific research.

4. Depending on the necessity of the research and development project, Party A may dispatch relevant employees to work at Party B's premises and collaborate with Party B's project team. During this period, Party A or its employees shall bear the salary, social security, and travel expenses of the employees. Party B shall not be held liable for any damages or losses incurred by the employees unless such damages or losses are caused by intentional or negligent acts of Party B or its personnel.

5. During the term of the agreement, Party A and Party B shall establish regular communication mechanisms. The project leaders from both parties shall communicate at least once a month to promptly discuss the progress of project implementation, provide feedback on key issues, challenges, and changes during execution, and discuss the next stages of work progress and results. In the event of a change in the project leader from Party A, Party B shall be notified in writing in advance.

**Article 3. Research Funding and Payment**

1. Based on the completion of the research and development tasks under this agreement, Party A shall pay Party B a total research fee of RMB 150,000.00 (including tax) (in words: One Hundred Fifty Thousand Yuan) according to the following schedule. The proposed payment schedule is divided into a ratio of 6:2:2 based on the total project amount. Upon receipt of Party B's VAT special invoice, Party A will make the research fee payments to the designated account provided by Party B. The invoicing information and matters related to invoicing of Party A shall be subject to the contents specified in Attachment 2, "Invoice List for Technical Project Cooperation."

First Payment: Within 30 calendar days after the effectiveness of this agreement, the official initiation of the research project, and receipt of Party B's VAT special invoice in full, Party A shall pay Party B an amount of RMB 90,000.00 (in words: Ninety Thousand Yuan).

Second Payment: Upon completion of the mid-term milestone results as stipulated in Attachment 1 and the submission of the algorithm model to Party A, and after successful acceptance by Party A and receipt of Party B's VAT special invoice in full, Party A shall pay Party B an amount of RMB 30,000.00 (in words: Thirty Thousand Yuan) within 30 calendar days.

Third Payment: Upon the completion of the research and development project, Party B shall submit all project deliverables and a project completion report to Party A. After successful acceptance by Party A and receipt of Party B's VAT special invoice of an equivalent amount, Party A shall pay Party B an amount of RMB 30,000.00 (in words: Thirty Thousand Yuan) within 30 calendar days.

Party A may refuse to accept Party B's submission of "Mid-term Output Results" or "Project Deliverables and Completion Report" only with reasonable justifications or relevant evidence.

2. The account information for Party B to receive payment is as follows:

Account Name: \*\*\*\*\*\*

Unified Social Credit Code: \*\*\*\*\*\*\*\*

Account Number: \*\*\*\*\*\*\*\*

Bank Name: \*\*\*\*\*\*\*\*

Address: \*\*\*\*\*\*\*\*

3. Upon the completion of payment of all research fees to Party B's aforementioned account, Party A's payment obligations under this agreement shall be deemed fulfilled, and no further payments shall be made to Party B, including but not limited to personnel expenses, material expenses, travel expenses, consulting fees, etc. The allocation and payment of expenses between Party B and the specific members of the project team responsible for this research and development project shall be handled by Party B, and any disputes or disagreements arising from it shall not affect the implementation of this agreement. Party B is obliged to provide Party A with a detailed summary of expenses in the format requested by Party A.

4. Party B shall be responsible for the payment of government taxes.

5. Ownership of the equipment, apparatus, and materials purchased using research and development funds: The equipment, apparatus, and materials purchased by Party B for technical design and experimentation using the research and development funds shall belong to Party B.

**Article 4. Intellectual Property Rights**

1. Any background intellectual property rights independently developed or acquired by either party prior to the effectiveness of this agreement, including intellectual property rights that the party has the right to use and license to third parties through authorization ("Background IP"), shall remain the property of that party.

2. Regarding the intellectual property rights generated through the development commissioned under this agreement ("Foreground IP"), they shall be owned by Party A from the moment of creation. At the same time, Party A grants Party B a non-transferable license to use the Foreground IP solely for academic research purposes. Without Party A's permission, Party B shall not provide the Foreground IP to any third party or use it for any purposes other than academic research, including but not limited to any commercial activities conducted independently by Party B or in collaboration with third parties.

3. In the event described in Article 4.2 of this agreement, Party A shall have the right to apply for patents, and Party A shall have ownership and rights to use the patent upon its acquisition. If Party A decides to waive the patent rights, Party B shall have the right to unilaterally apply for and maintain the patent. If Party A plans to waive the patent rights, Party B shall be notified in advance and shall be solely responsible for the application and maintenance of the patent, with the corresponding costs borne by Party B.

4. If the results or intellectual property rights generated under this agreement include Party B's background intellectual property rights, Party B agrees to grant Party A and/or its affiliates a non-exclusive, sublicensable, perpetual, irrevocable, worldwide, royalty-free license with respect to the relevant background intellectual property rights, to fully ensure that Party A and/or its affiliates have the right to use the results or intellectual property rights.

5. Party B warrants to Party A that: (1) the technology provided or generated by Party B during the project development does not infringe upon the intellectual property rights of any third party; (2) the technology provided or generated by Party B during the project development (excluding any third-party intellectual property rights) is not subject to any encumbrances, transfer restrictions, or other third-party rights.

**Article 5. Publication**

1. Except as provided in Article 5.2, Article 5.3, and Article 5.4, with the prior review and written consent of Party A, Party B may publish or disseminate, in whole or in part, the research results formed during the research and development project, including presenting them at domestic or international discussions, conferences, symposiums, or publishing them in journals, dissertations, or other venues selected by Party B. Party A should be acknowledged as the project commissioner in the publication.

2. In order to avoid inappropriate disclosure of proprietary information or loss of intellectual property protection through public disclosure, Party B shall provide Party A with copies of all materials to be published or publicly presented ("Publication Materials") at least 60 calendar days in advance.

3. After receiving the aforementioned Publication Materials, Party A shall review them and provide feedback within 30 calendar days. Failure to respond within the specified time shall be deemed as Party A's agreement with Party B's Publication Materials.

4. Party A has the right to request Party B to delete proprietary information (information exclusively owned by Party A or its affiliated companies) or Party A's confidential information from the Publication Materials or to request the rewriting of certain content to avoid the disclosure of proprietary or confidential information. Party B shall comply with Party A's aforementioned requests.

5. Standard Acknowledgment in Papers: In the papers resulting from the project, Party B should add the following statement to the acknowledgment section: "This work was supported by Ant Group."

**Article 6. Confidential Information**

1. Both parties may disclose confidential information ("Confidential Information") to each other based on the work carried out under this agreement. The receiving party shall prevent the disclosure of the disclosing party's confidential information to any unauthorized third party and shall only use such information for the purposes of this agreement. The receiving party shall have no confidentiality obligations with respect to information that falls under the following circumstances:

a) The information was already in the possession of the receiving party prior to the disclosure;

b) The information enters the public domain through means other than the receiving party's fault;

c) The information is received from a third party without any confidentiality obligations to the disclosing party;

d) The information was independently developed by the receiving party prior to the disclosure;

e) The disclosure is required by law, regulation, or rule, provided that the receiving party has used all reasonable available legal means to avoid such disclosure, and upon the requirement of the law, regulation, or rule, the receiving party promptly notifies the disclosing party, allowing the disclosing party to seek appropriate protective measures or other remedies.

2. Both parties agree to use confidential information solely for the purposes of this agreement and not to disclose the confidential information to any unauthorized third party during the term of this agreement and for a period of 3 years after its expiration or termination.

**Article 7. Public Disclosure**

Unless required by law or with the written consent of both parties, press releases or other statements related to the work under this agreement shall not be used for public media. Unless otherwise specified in this agreement, without the written consent of the other party, the other party shall not use the name, logo, trademark, title, or the names or titles of its employees, or any abbreviations/acronyms or adaptations similar to any of the aforementioned items, in any press release or publicly released publication, promotional materials, or advertising data.

**Article 8. Warranty & Commitment**

1. The Party B guarantees and undertakes to perform the research and development project in a professional, diligent, competent, and timely manner.

2. The Party B guarantees and undertakes that all the results generated from the research and development project under this agreement, or any other results arising from the performance of this agreement, are original and do not infringe upon any copyrights, patents, trade secrets, trademarks, or other intellectual property rights or lawful rights and interests of any third party.

3. The Party B guarantees and undertakes that it has the full rights, abilities, and authorities to fulfill its obligations under this agreement, including the transfer of intellectual property and deliverables that can be applied for by the Party A, and that such rights, abilities, and authorities are not limited by any other contract, nor does the party B need to assume any obligations to any third party that would restrict the exercise of these rights, abilities, and authorities. The transfer of such intellectual property is not affected by any valid claims made by any third party regarding any rights, qualifications, deliverable benefits, trade secrets, or technical information.

4. The Party B guarantees and undertakes that there are no circumstances that exist or may arise that would significantly interfere with or contradict the performance of this agreement.

**Article 9. Duration and Liability Assumption**

1. This contract shall come into effect from the date of signature and seal by both Party A and Party B, with a validity period of one year.

2. If either party fails to fulfill its rights and obligations as stipulated in this contract, it shall constitute a breach. The defaulting party shall bear the liability for breach according to the actual losses suffered by the non-defaulting party. If the defaulting party fails to correct the breach within 30 calendar days from the date of receiving the correction notice issued by the non-defaulting party, and obtain the recognition of the non-defaulting party, the non-defaulting party may terminate this contract.

3. In the event that Party B fails to complete the research and development project and submit the results to Party A in accordance with the provisions of this contract and its attachments, or engages in other breaches, Party A shall have the right to suspend and reclaim partial or all of the research and development funds, and may demand Party B to assume corresponding liability for the breach as determined by the breach situation. If such breach leads Party A to terminate this contract in accordance with Article 9, Clause 2, Party A shall have the right to suspend and reclaim partial or all of the research and development funds and may demand Party B to assume corresponding liability for the breach as determined by the breach situation.

4. In the event of a violation of the provisions of Article 3 of this contract, Party A shall assume liability for breach and shall pay a daily overdue penalty of 0.5‰ of the overdue amount, with Party B's plans being extended accordingly.

5. If either party undergoes bankruptcy, bankruptcy administration, closure, debt allocation, or similar situations during the effective period of this contract, the other party may immediately terminate this contract upon written notification.

6. Termination of this contract by either party for any reason shall not affect the rights and obligations arising between the parties prior to the effective date of termination, especially those specified in Articles (4, 5, 6, 7, 8, 9, 10) of this contract.

7. Assumption of risk and liability: In the performance of this contract, if the research and development partially or completely fail due to technical difficulties that cannot be overcome with the current level of technology and conditions, both parties shall reasonably assume the risks and liabilities in accordance with their respective inputs of manpower, material resources, and financial resources.

8. If Party B's project leader is no longer employed by Party B for any reason, this agreement shall automatically terminate upon the cessation of the project leader's employment by Party B, or at any time after Party A becomes aware that the employment of the project leader by Party B is expected to end, according to Party A's choice.

9. Notwithstanding the above provisions, Party B's total liability for any breach under this contract shall not exceed the total fees received from Party A.

**Article 10. Other Provisions**

1. This contract and its attachments constitute the entire agreement between the parties regarding this research and development project and shall supersede any previous oral, written, explicit, or implied commitments, agreements, and warranties made by the parties.

2. This contract is executed in six copies, with Party A holding three copies and Party B holding three copies, all of which have equal legal effect. Any waiver, amendment, or modification of this contract shall be invalid and have no binding force unless agreed upon and signed by both parties in writing.

3. Neither party shall transfer this contract without the written consent of the other party.

4. Any disputes arising between the parties relating to this contract shall be resolved through good faith negotiations. If the negotiations fail, either party may file a lawsuit with the People's Court at the location of Party A.

5. Neither party shall be held liable for any losses or delays caused by force majeure, including but not limited to government orders or restrictions, war, blockade, embargo, riots, strikes, alerts, epidemics or other pandemics, fires, floods, economic crises, or any other events and circumstances beyond their reasonable control.

6. If any provision of this contract is found to be invalid or unenforceable for any reason, it shall not affect the validity and enforceability of the other provisions.

7. In the event that either party needs to change their contact information during the performance of this agreement, they shall provide written notification to the other party at least 3 calendar days in advance. Failure to do so shall make the party responsible for any losses incurred as a result of the change.

8. Either party may terminate this contract by providing a written notice three months in advance. However, after the termination of the contract, except with the written agreement of both parties, it shall not affect ongoing but unfinished cooperation or alter any legal responsibilities that either party needs to assume.

9. No person who is not a party to this contract shall have any rights to the benefits of any provisions in this contract.

Attachment 1: "Project Research and Development Description"

Attachment 2: "Invoice List for Technical Project Cooperation"

(End of document)

**Article 11. Signing Page**

|  |  |
| --- | --- |
| Party A: | Party B: |
| Stamp: | Stamp: |
| Date: Day Month Year | Date: Day Month Year |

**Attachment 1:**

**Project Research and Development Description**

1. **Introduction**
   1. **Research Title**

Vulnerability Detection in Complex Software Systems using Large-scale Language Models and Software Testing

* 1. **Project Background & Research Value**

In large financial companies like Ant Group, software vulnerabilities can pose significant risks, including financial losses and reputation damage. Ant Group's highly interconnected and complex software ecosystem provides various service capabilities, including financial services, e-commerce, and cloud computing, but it also increases the potential impact of software vulnerabilities. Ant Group must minimize the risks associated with software vulnerabilities and reduce potential financial and system risks caused by code vulnerabilities by implementing strict software testing, continuous monitoring, and timely remediation.

In terms of specific business operations, Ant Group offers various application services such as payment, finance, and digital life. The unique business logic and evolving nature of these applications make vulnerability detection and tracking challenging. Although vulnerability detection models based on deep learning have successfully identified vulnerabilities in publicly available datasets, they cannot be directly applied to accurately discover and locate vulnerabilities in Ant Group's vast and complex system architecture. On the other hand, traditional software testing methods can generate meaningful test cases but heavily rely on expert experience to generate corresponding test instances, which has clear scalability limitations. Currently, in the academic community, there are attempts to combine large-scale learning models and software testing to explore deeper levels of vulnerability discovery.

The combination of large-scale language models and software testing can provide an effective approach to detect and locate software vulnerabilities. Language models can recognize patterns and common vulnerabilities in code and then be used to generate test cases targeting these vulnerabilities. Additionally, language models can detect hidden vulnerabilities and edge cases that traditional testing methods may not detect. By combining large-scale language models and software testing, more accurate and targeted test cases can be generated to locate and explore the most subtle vulnerabilities in software systems, thereby improving the overall security and reliability of the entire software system. Specifically, for large technology-driven financial companies like Ant Group, it is necessary to effectively model the semantic and syntactic information of code in a vast and complex system codebase to achieve efficient vulnerability detection and accurate localization.

Therefore, this research focuses on the complex system structure and architecture within technology-driven financial systems to study the fundamental theories and technologies related to potential vulnerabilities and risks in code.

* 1. **Objectives & Methods**

From a research perspective, software vulnerability mining is a process that involves identifying design errors, coding defects, and runtime failures in software systems using various methods such as static and dynamic analysis. Static analysis is used during the coding phase to scan the source code and discover vulnerabilities, while dynamic analysis is used during testing and runtime to analyze the dynamic behavior of the program and uncover vulnerabilities. Currently, most commonly used vulnerability mining methods are based on these two paradigms, and there are various tools available, such as Coverity and KLEE, for vulnerability mining. Attempts have also been made to combine static and dynamic symbolic execution analysis for automated binary analysis. Fuzz testing is an important automated software testing technique that involves injecting a large amount of invalid or unexpected data into the software to locate defects and vulnerabilities. However, these methods may have limitations when it comes to large and complex software systems due to the lack of understanding of syntax and semantic information in the code. The academic community is exploring new intelligent software vulnerability discovery methods and optimizing existing methods.

In this project, our aim is to leverage large-scale language models (LLM) and state-of-the-art fuzz testing methods to generate efficient and interpretable test cases, bridging the research gap. These test cases can effectively reveal and locate vulnerabilities in Ant Group's diverse and large-scale ecosystem, thereby increasing the security and robustness of the system while reducing debugging efforts for the testing and development teams. This has high business value.

The objective of this project is to combine deep learning theory and software testing methods to research key issues related to "vulnerability detection and accurate localization." The ultimate goal is to construct efficient test cases for detecting potential vulnerabilities in Ant Group's industrial-grade ecosystem and assist developers in locating and fixing these vulnerabilities. The specific objectives are as follows:

1. This project aims to leverage large-scale language models (LLM) to innovate test case generation methods and improve the efficiency of vulnerability detection and localization, achieving breakthroughs in foundational theory and feasibility.
2. Compared to traditional methods and state-of-the-art (SOTA) methods in the academic community, the proposed approach in this project aims to achieve at least a 5% increase in the ability to discover code vulnerabilities and a 5% improvement in accuracy.
3. This project will also be applied in practical scenarios within Ant Group, supporting application-level vulnerability detection and localization to enhance the robustness and security of applications.
4. Lastly, the project aims to publish 1 to 2 papers in top-tier conferences and journals in the field of software engineering and related areas as academic achievements.
5. **Research Plan**
   1. **Project Duration**

1 Year

* 1. **Schedule**

|  |  |  |  |
| --- | --- | --- | --- |
| **Phase** | **Content** | **Duration** | **Submissions** |
| 1st | SOTA Fuzzing | 2023.06—2023.08 | Algorithm prototype and standard dataset test results |
| 2nd | SOTA Fuzzing with LLM | 2023.08—2023.11 | Algorithm prototype and standard dataset test results |
| 3rd | Vulnerability detection solution based on actual ant system while preparing writing academic papers | 2023.11—2024.02 | Source code and solution test report |
| 4th | Operational evaluation of the test solution | 2024.02—2024.04 | Project report |
| 5th | Summary of academic results and prepare final version of academic papers to be submitted | 2024.04—2024.06 | Publish 1 or 2 CCF-A papers based on the research |

[Notes：]

1. **Expected Outcomes & Validation Metrics**
2. Mid-term Deliverables

- Proof-of-Concept (PoC) results of the algorithm model and integration of research findings.

- Completion of vulnerability detection algorithm design, code development, and application verification, with delivery of the algorithm source code. The performance of the proposed algorithm is expected to show a relative improvement of 5-10% compared to the state-of-the-art (SOTA) algorithms in target detection.

- Initiation of writing 1-2 papers for submission to CCF-A class or top-tier journals/conferences in the field. Assistance in the filing of 1-2 patents by Ant Group.

1. Final Deliverables

- Delivery of the finalized algorithm and research outcomes.

- Innovative achievements: Submission and publication of 1-2 papers in CCF-A class or top-tier conferences/journals recognized by Ant Group.

- Technical indicators: Deployment of the collaborative results in several software systems within Ant Group, achieving precise detection and localization of software vulnerabilities. The online effect is expected to improve by 10% in supporting application-level vulnerability detection and localization.

1. **Human Resources, Equipment & Budget**
   1. **Human Resources (including project team members)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Affiliation and Position** | **Salary (CNY)/month** | **Duration (month)** | **Total salary (CNY)** | **Responsibilities** |
| James Xi Zheng | Associate Professor (tenured), Macquarie University, Australia | NA | 12 | NA | Project Leader |
| Yuxuan Cai | PhD Candidate, Macquarie University, Australia | 5000 | 8 | 40000 | Test case generation algorithm development |
| Yuzhe Tian | PhD Candidate, Macquarie University, Australia | 5000 | 8 | 40000 | LLM training |
| Yupeng Jiang | PhD Candidate, Macquarie University, Australia | 5000 | 3 | 15000 | Test case generation algorithm development |
| Siwei Luo | PhD Candidate, Macquarie University, Australia | 5000 | 3 | 15000 | LLM training |
| Yao Deng | Post Doc, Macquarie University, Australia | NA | 3 | NA | LLM training |
| Yihao Zhang | Undergraduate student, Macquarie University, Australia | NA | 3 | NA | Testing & Deployment |

The above-mentioned personnel are full-time staff of Party B dedicated to this project. If there are any interns in this project, it is recommended that the internship period should not be less than 3 months; whether the internship is required or not will be decided based on the business needs and communication between the business party and the cooperating professor. (The cost of the above staff is included in the total project funding; the internship fee (e.g. travel, accommodation, meals, etc.) is included in the total project funding).

* 1. **Equipment**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Equipment** | **Quantity** | **Price (CNY)** | **Total (CNY)** | **Notes** |
| None | - | - | - | - |

* 1. **Budget**

|  |  |  |
| --- | --- | --- |
| **Category** | **Total (CNY)** | **Notes** |
| 1. Human resource expenses | 110,000 | Same as 4.1 |
| 1. R&D expenses | 30,000 | Covered by PI |
| Travel/conference expenses | 10,000 | 1. The domestic travel cost per trip is 5000 yuan, and the international travel cost per trip is 15000 yuan. The actual expenses will be considered.  2. The allowances, subsidies, insurance, and all other expenses for students during their internship at Ant Group are included in this fund. |
| Equipment costs | 0 | Same as 4.2 |
| Other costs | 0 | By the project PI according to the project reasonable to fill |
| 1. Direct costs | 150,000 | ① + ② |
| 1. Indirect costs | NA | School college management fee, special ticket tax |
| Total | 150,000 | ③ + ④ |

1. **Resources invested by the Party A**
2. Party A shall assign 3-5 research assistants with high professional competence in the research areas agreed in this Agreement to assist Party B in the concrete implementation and grounding of its research contents in Party A.
3. During the term of this Agreement, in order to fulfill the research plan agreed herein, Party B may use certain Party A's resources provided by Party A, such as using the materials, facilities and equipment required for the research provided by Party A. Relevant Party A resources include the following (based on actual description):
4. Party B shall not use our resources for activities outside the scope of the research agreed between the parties in this Annex, including but not limited to using Party A’s resources or facilities to carry out any consultancy or any work for other institutions (including but not limited to their current employers).
5. **Exclusive Clause**
6. Prior to the effectiveness of this agreement, if the project leader of Party B has provided consultancy or advisory services to companies in the same or similar industry as Party A, during the term of this agreement and within one (1) year after the termination of this agreement, the project leader of Party B may continue to provide such services to those companies. However, they shall not expand the scope of services already provided before the effectiveness of this agreement, nor shall they join those companies. The aforementioned companies include but are not limited to Tencent Technology (Shenzhen) Co., Ltd. and Beijing Baidu Netcom Science Technology Co., Ltd.
7. During the term of this agreement and within one (1) year after the termination of this agreement, the project leader of Party B shall not provide consultancy, advisory, or research services related to the project content (\*\*\*\*\*\*for example: search recommendation, financial risk control, etc.) to companies in the same or similar industry as Party A, nor shall they join any companies that compete with Party A. The aforementioned companies include but are not limited to the following and their affiliates:
8. Beijing Jingdong 360 Degrees E-commerce Co., Ltd.
9. Huawei Technologies Co., Ltd.
10. Beijing ByteDance Technology Co., Ltd.
11. Tencent Technology (Shenzhen) Co., Ltd.
12. Beijing Baidu Netcom Science Technology Co., Ltd.
13. Zhejiang Hexin Tonghuashun Network Information Co., Ltd.
14. Qudian Inc.
15. Qulian Technology
16. Ping An Technology
17. Ping An Financial Yizhangtong
18. WeBank
19. Party B understands and acknowledges that when accepting the fees payable by Party A as stipulated in this agreement, Party B has fully considered and accepted the exclusive arrangement and its consequences under this clause. Party A shall not be obligated to provide any compensation beyond the fees already agreed upon in this agreement for the fulfillment of the exclusive clause by Party B and its project leader.

**Attachment 2:**

**Invoice List for Technical Project Cooperation**

**Party A invoicing information:**

Name: \*\*\*\*\*\*\*\*\*\*

Tax ID: \*\*\*\*\*\*\*\*\*\*

Bank name: \*\*\*\*\*\*\*\*\*\*

Account number: \*\*\*\*\*\*\*\*\*\*

Company Address: \*\*\*\*\*\*\*\*\*\*

Phone: \*\*\*\*\*\*\*\*\*\*

Invoicing tax rate: Ant Group default 6%, actual subject to the university

Invoice content: Technical services, technology development

**Invoice mailing address and recipient information:**

Address: \*\*\*\*

Contact Person: \*\*\*\*

Phone: \*\*\*\*