AI SINGAPORE RESEARCH PROGRAMME
GRANT CALL 2021

1.   About the Programme

1.1   The AI Singapore (AISG) Research Programme supports research projects on a competitive basis across Singapore-based Institutes of Higher Learning (IHLs)[1] and Research Institutions (RIs)[2].

1.2   The objective of the Programme is to seed high-quality research efforts aimed at developing AI and adjacent technologies that will eventually contribute to the other pillars of AI Singapore.

1.3   The AISG funds must be used on AI research that emphasised on novel and significant contributions in methodologies and algorithms, rather than domain-specific solutions.

1.4   Research ideas at the intersection of multiple disciplines are encouraged. The theme of the proposed research programme must be motivated by an important need or problem to be solved, rather than solely curiosity-driven. AISG Research Grant Call 2021 aims at funding multi-disciplinary AI applications reflecting novel ideas/visions that are underexplored, and/or also have a clear and significant social impact.

2.   Grant Call Themes

2.1   In the **AI Research Grant Call 2021** for Proposals, AI Singapore invites proposals in advanced fundamental AI research for the following themes:

2.2   **Theme One: Continuous Learning AI**

This theme centres on advancing the **state of the art in continuous learning AI** and the following are the two areas of interest:

i.   Self-Supervised Learning
ii.   Lifelong Learning

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[1] _Institutes of Higher Learning (IHLs)_: National University of Singapore (NUS), Nanyang Technological University (NTU), Singapore Management University (SMU), Singapore University of Technology and Design (SUTD), Singapore Institute of Technology (SIT), Singapore University of Social Sciences (SUSS).

[2] _Research Institutions (RIs):_ A*STAR Research Institutes and CREATE entities.

2.3 **Theme Two: Resource Efficient AI**

This theme centres on advancing the **state of the art in resource efficient AI** and the following are the five areas of interest:

i. Learning from Small Data Sets
ii. AI Understanding of Design and Creation
iii. Human AI Co-Design
iv. Knowledge Representation with Complex Priors or Measurements
v. Science-Inspired or Physics-Based AI Systems and Models

2.4 **Open AI Fundamental Research Theme**

This theme centres on advancing novel visionary fundamental AI research with significant future impact.

The proposed research to be performed in this proposal should serve as preliminary studies and validation necessary for the research team to realise their proposed long-term vision and subsequently apply to future grant funding (e.g., MOE Tier 3) with a large quantum (e.g., above S$5 million value).

2.5 The proposals may include, **but not limited to**, **the proposed sub-themes**.

2.6 Each proposal should **address one of the three themes listed above**. Proposals with multiple themes **will not be considered for evaluation.** Hence, proposals with a clear research focus of a single theme are highly preferred.

3. Funding Support

3.1 The Programme will support each proposal for a duration of up to 3 years. Funding of each proposal is either up to S$500,000 for an open theme or up to S$1 million for the two main themes. The total funding is inclusive of 20% IRC.

Themes	Funding (Inclusive of 20% IRC)	Duration
Theme One: Continuous Learning AI **Theme Two:** Resource Efficient AI	Up to S$1 million	Up to 3 years
Open AI Fundamental Research Theme	Up to S$500,000	

3.2   The proposal should be based on a realistic budget with appropriate justifications that correspond to the scope of work to be accomplished. The total cost of each project includes all approved direct costs[3] and indirect research costs/overheads[4]. All expenditure budgeted should be <u>inclusive</u> of any applicable Goods and Services Taxes (GST) at the prevailing rates.

3.3   Please refer to **Annex A** for Guidelines for the Management of Competitive R&D Grants under AI Singapore Programme, including the list of "Non-fundable Direct Costs".

3.4   For all direct cost items proposed for the project, please note that:

   i.   Host Institutions must strictly comply with their own procurement practices;
   ii.   Host Institutions must ensure that all cost items are reasonable and are incurred under formally established, consistently applied policies and prevailing practices of the host institution; and
   iii.   All items/services/manpower purchased/engaged must be necessary for the R&D work.

3.5   PIs/Co-PIs/host institutions shall use reasonable efforts to employ or otherwise engage Singapore citizens and/or Singapore Permanent Residents to be deployed in the work under the project.

3.6   Decision on the funding support to be awarded for each project is final and no appeals will be entertained.

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[3] Direct costs are defined as the incremental cost required to execute the project. This **excludes** in-kind contributions, existing equipment and the cost of existing manpower as well as building cost. Supportable direct costs can be classified into expenditure on manpower (EOM), expenditure on equipment (EQP), other operating expenses (OOE) and overseas travel (OT).

[4] Indirect costs are expenses incurred by the research activity in the form of space, support personnel, administrative and facilities expenses, depending on the host institution's prevailing policy. Host institutions will be responsible for administering and managing the support provided by AI Singapore for the indirect costs of research.

4. Eligibility Criteria

4.1 At the point of application, PI must fulfil the following requirements:

   i. Hold a full-time appointment[5] in a Singapore-based Institute of Higher Learning (IHL), or Research Institute (RI);
   ii. Must be an expert in AI domain; an AI expert is defined as a person with strong track record of publications from AI conferences and journals.
   iii. Must be an independent researcher with a track record of leadership ability in coordinating research programmes and providing mentorships to research team, as well as having productive research outcomes; and
   iv. No outstanding report(s) from other national grants.

4.2 At the point of application, **Co-PIs** must fulfil the following requirements:

   i. Hold a full-time appointment in a Singapore-based Institute of Higher Learning (IHL) or Research Institution (RI); and
   ii. No outstanding report(s) from other national grants.

4.3 Researchers from Medical Institutions[6], AI Start-ups in Singapore, private sector and other entities are eligible to apply as Collaborators.

4.4 Only research conducted in Singapore may be funded under the Programme.

5. Selection Process and Evaluation Criteria

5.1 Proposals are selected based on academic significance, international excellence, novelty and societal impact.

5.2 The proposals will be evaluated based on:

   i. **Academic significance in the relevant research fields.** This could be demonstrated in terms of the conferences and journals the research team intends to publish.
   ii. **Novelty of research directions** that challenge current understanding or provides pathways to new frontiers.
   iii. **Direct implications on the economy and/or society**. This could be demonstrated in terms of intellectual property produced, technologies deployed, manpower trained/spun off to industry and overall value-add to target groups.

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[5] Defined as at least 9 months of service a year based in Singapore or 75% appointment.
[6] Researchers from Medical Institutions in Singapore who hold at least 25% joint appointment in a Singapore-based Institute of Higher Learning (IHLs) and/or Research Institution (RI) may apply as PI or Co-PI. If awarded, the grant will be hosted in the IHL/RI.

5.3 **Open theme proposals,** which focus on advancing novel visionary fundamental AI research with significant future impact and potential to be supported by a large-quantum funding to realise their long-term visions, will be favourably considered.

5.4 Proposals will be assessed by a Scientific Evaluation Committee and AI Singapore.

5.5 All decisions are **final** and no appeals will be entertained.

6. Grant Call Timeline

6.1 The schedule for **the Grant Call 2021** is as follows:

Event	Dates
Announcement of Grant Call	20 August 2021
Opening date for <u>softcopy</u> submission (via portal)	20 September 2021
Closing date for <u>endorsed</u> softcopy submission (via portal)	12 November 2021
Peer Review & Evaluation Process	November 2021 to January 2022
Release of Outcome and Award	February 2022
Project Commencement	1 April 2022

7. Application / Contact

7.1 The AI Singapore Research Programme Application Portal for proposal submission is available from **20 September 2021, 12pm** on https://grantportal.aisingapore.org/, alternatively, it is also accessible through https://www.aisingapore.org/research/.

7.2 All applications are required to be submitted through the Application Portal. Email submissions will not be accepted unless exception granted by AI Singapore.

7.3 Interested applicants should submit the AI Singapore Research Programme application form with all the sections duly filled by the stipulated deadline in two format:

  i. Input values through the portal fields, and;
  ii. AI Singapore Application Form (PDF) and Annexes (PDF) in ZIP form

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7.4 Only complete applications with the endorsement of the relevant institutional authority / director of research (or equivalent), will be accepted by AI Singapore.

7.5 Each eligible institution[7] must follow the quota below:

7.5.1 For Research Teams with PI and all Co-PIs applying under the Main Themes (AI Continuous Learning AI and Resource Efficient AI)
- no more than four (4) applications each for NUS, NTU, and A*STAR;
- no more than two (2) applications each for SMU, SUTD, SUSS, SIT and CREATE entities.

7.5.2 For Research Teams with PI and Co-PIs applying under the Open Theme,
- up to three (3) applications per institution, based on Host Institution.

7.5.3 Subject to the above criteria, for a combination of "Main Theme" and "Open Theme" proposals, each Institution may only submit:
- no more than five (5) applications each for NUS, NTU, and A*STAR;
- no more than four (4) applications each for SMU, SUTD, SUSS, SIT and CREATE entities.

7.6 The table below summarizes the submission limit:

Submission Quota	No. of proposals per institution		
	Main Theme	Open Theme	Maximum Submission (Combination)
NUS/ NTU/ ASTAR	4	3	5
SMU/ SUTD/ SUSS/ SIT/ CREATE entities	2	3	4

7.7 Late submissions or submissions from individual applicants without endorsement from the relevant institutional authority / director of research (or equivalent) (by the deadline stipulated above) will not be entertained.

7.8 For more information, please contact research@aisingapore.org.

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[7] Applicable to Institutes of Higher Learning (IHLs): National University of Singapore (NUS), Nanyang Technological University (NTU), Singapore Management University (SMU), Singapore University of Technology and Design (SUTD), Singapore Institute of Technology (SIT), Singapore University of Social Sciences (SUSS) and Research Institutions (RIs): A*STAR Research Institutes, CREATE entities.

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8.   Instructions to Applicants & Host Institution

8.1   Please note that **respective institution's application deadline may differ** from AI Singapore's deadline.

8.2   PI and Co-PIs are required to provide their Google Scholar and/or DBLP in the application form (not mandatory for Collaborators) and are expected to commit a proportionate amount of their time to the project.

8.3   Please note the following instructions on specific information to be provided in the relevant sections of the application form:-

8.3.1 Section 1 - Cover Sheet

This section should state clearly the time commitment of each team member (PI/Co-PIs and Collaborators). All PIs and Co-PIs must provide their Google Scholar and/or DBLP identifiers (refer to https://dblp.uni-trier.de/).

8.3.2 Section 2 - Details of Research Proposal

A paper proposal with **a limit of 10 pages** (including Section 2 Lay Abstract) in size 11-point Arial font with full justified margins, single-line spacing. **Applications failing to follow the prescribed format may be rejected without a review**.

The case for support should include the following sections and information specified in the following table:

Sections Required	Information to be Provided
Lay Abstract	Maximum of 500 words summarizing the project proposed, written for the understanding of individuals not trained in the scientific field. This abstract should be written in relatively simple and non-technical language.
Research Objectives	This section should articulate clearly the use-inspired objectives and expected outcomes of the project.
Proposed Approach, Project Plan, Role of Team Members	• Details should be provided on the scientific challenges to be addressed and the proposed methodology/approach to solving these challenges. • PI/Co-PIs should highlight in this section the importance of the problems being addressed, how their work would create new knowledge or advance existing understanding, the novelty of their proposed approach and the potential for this

Sections Required	Information to be Provided
	to produce breakthrough work. • Explanation on the financial and human resources required to accomplish the objectives, the project schedule and the mitigation of risks should be included. • The PI, Co-PIs and other team members should also be identified in this section, highlighting any competitive advantages of individual members in terms of unique capabilities and/or experience relevant to the project's focus. • This section should also be used to highlight the international competitiveness of the work being carried out in terms of merit with mentions of existing work being carried out by other teams around the world.
Outcomes and Deliverables	• A summary of the deliverables and outcomes for the project should be provided in this section. KPIs proposed should be linked to the objectives of the project and should be as quantitative as possible (e.g. learning from 5 times fewer labelled samples, etc.) – as a means to track/measure the success of the project at mid-term and at completion. • PIs should also use this section to highlight important potential/possible future outcomes from the successful execution of the project. • The detailed listing of KPIs should be provided in Section 5 of the application form.

8.3.3 Section 3 – Proposed Budget

PIs should fill in the detailed budget breakdown in this section of the form, broken down into the categories and sub-categories, mainly:
  i.   EOM;
  ii. Equipment;
  iii. OOE, with sub-categories for local conferences/ working visits/ meetings, materials and consumables (including animal costs if any) and miscellaneous costs or others; and
  iv. Overseas Travel (OT), including overseas conferences/ working visits/ meetings. Any additional information (e.g., equipment quotations, OOE details, etc.) should be provided as separate attachments. Further line item breakdown is required in sub-section (B). Only details for the amount of funding sought under AI Singapore should be provided in this section; other sources of funding for the project should be indicated separately and clearly in the "Other Funding Support" section for AI

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Singapore's information. Please refer to Annex A for the list of direct cost items (non-exhaustive) that are non-fundable under AI Singapore.

8.3.4 Section 4 – Declaration of Other Funding Support

Details of all grants currently held or being applied for by the PI and Co-PIs listed on the cover page, in related areas of work, <u>must</u> be declared in this section.

Failure to do so will be considered a breach of the undertaking required by all PI and Co-PIs in Section 6 of the application form and may render the application invalid. Please refer to **Annex C** in the application form for reference.

8.3.5 Section 5 – Performance Indicators

PIs should provide full details of the KPIs for their project.

8.3.6 Annex A – Project Implementation Schedule

PIs should provide full details of the project implementation schedule.

8.3.7 Annex B – Curriculum Vitae

The 2-page CVs of all PI, all Co-PIs and Collaborators listed on the cover page must be provided according to the format provided.

8.4 Proposals submitted should contain all relevant information required for a proper and complete evaluation of their merits without the need to go back to applicants for additional information. Relevant privileged or confidential information should be disclosed if necessary to help convey a better understanding of the proposed project. However, such information should be clearly marked in the proposal.

8.5 Appendices should contain supporting diagrams, references and Gantt chart to illustrate the points mentioned in Section 2. However, **elaboration of proposals' contents within appendices will not be reviewed.**

8.6 A complete set of signatures may be provided using multiple copies of Section 6 (the undertaking section) of the application form. The softcopy submission will be taken as the final and complete version of the proposal.

8.7 Submissions which are <u>incomplete</u> (e.g., missing Google Scholar and/or DBLP identifiers, missing host institution endorsement) or not received by the close of the relevant call will not be considered.

8.8 Research support office from the IHLs and/or Research Institutions are required to ensure

that information submitted by their researchers complies with the requirements outlined in the application guideline. The following **will be rejected without review:**

i.   Missing or wrong version of application form.
ii.   Inappropriate format (e.g. small font size and tight para spacing) or incomplete applications (e.g. sections left blank, missing CVs, etc.).
iii.   Late submission.
iv.   Revisions, made after closing date.
v.   Proposal not within theme/scope
vi.   Duplicates of proposal submitted to any other public funding agencies for simultaneous consideration.
vii.   Ineligibility of PI and/or Co-PIs.

8.9   PI and Co-PIs should note that **parallel submissions are not allowed** – i.e. applicants **must never send** similar versions or part(s) of the current proposal application to other agencies or grants for funding (or vice versa).

8.10   The budget for the research proposal should be prepared according to the guidelines stipulated by the AI Singapore Research Programme and the applicant's host institution/research institute.

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9.   Terms & Conditions of Award

9.1   Funding from AI Singapore will be awarded to and managed by the Host Institution of the PI and/or Co-PI. No part of AI Singapore funding will be awarded to Collaborator(s).

9.2   [Not applicable for AI Research Grant Call 2021] ~~For Overseas Co-PI, the status will be reviewed by AI Singapore. AI Singapore will inform if the proposed overseas Co-PI was approved to be pursue prior to the award. Funds will only be reimbursed for overseas Co-PI after an International Research Collaboration Agreement was provided to AI Singapore within a year from the date of award.~~

9.3   The detailed terms and conditions applicable to the grant are specified in the document, entitled "Terms and Conditions of the AI Singapore Research Programme", that will be attached during the award.

9.4   AI Singapore will disburse funds on a reimbursement basis. Host institutions shall submit requisitions for direct and/or indirect costs for which the funding is permitted to be used **to AI Singapore on a half-yearly basis** using the forms provided. Requisitions shall include detailed schedules of expenditure incurred for the previous period, as certified by its chief financial officer or an authorised nominee.

9.5   No funds shall be disbursed for approved projects unless:
   i.   The relevant research collaboration agreements (where applicable) have been signed.
   ii.   The respective research compliance approvals (where applicable) have been obtained from the appropriate board/office.

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ANNEX A: GUIDELINES FOR MANAGEMENT OF COMPETITIVE R&D GRANTS (AI SINGAPORE)

ANNEX B: INSTRUCTIONS TO INSTITUTION'S APPOINTED AUDITOR ON FINANCIAL AUDIT (RESEARCH)

ANNEX C: AI SINGAPORE RESEARCH PROGRAMME TERMS AND CONDITIONS