Call Fiche 6th Call FFG CAS

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Cooperative R&D Projects between Austria, FFG and China, CAS

The Austrian-Chinese Cooperative Research and Development (R&D) Projects (CRDP) are jointly supported with funding from the Austrian research program ICT of the Future, managed by the Austrian Research Promotion Agency (FFG) on behalf of the Austrian Federal Ministry of Transport, Innovation and Technology and the International Cooperation with Chinese Academy of Sciences (CAS).

Deadline for submission to FFG via eCall and to CAS:
FFG: May 6th 2020, 11:00 Central European Summer Time (C.E.S.T.)
CAS: May 6th 2020, 17:00 China Standard Time (C.S.T.)

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Content

1. Aim of the funding measure

The aim of this sixth call for Austrian-Chinese Cooperative R&D Projects (CRDP) is to support the jointly identified research topic ICT with mutual interests and scientific excellence based on the existing cooperation agreement between the Austrian Research Promotion Agency (FFG) and the Chinese Academy of Sciences (CAS). It is purposed that this call will foster the connections between Austria and China and improve the visibility of the successful collaboration between the two parties. Furthermore, it is expected that the sixth Austrian-Chinese call for Joint Proposals will lead to further bilateral or multilateral cooperations at various levels.

The Austrian-Chinese joint Cooperative R&D Projects funded in the framework of this sixth call are intended to intensify scientific and applied research cooperations between Austrian and Chinese research organisations and companies in order to set new impulses for excellent research between the two countries. The special focus of the projects lies in the expected scientific and applied research achievements, know-how transfer, as well as in the promotion of excellent young scientists, post-docs and PhD students in the framework of the Cooperative R&D Projects. The participation of female scientists is particularly welcome.

2. Subject of funding

- This call shall bring together research capacities from **one or more CAS research groups and one or more Austrian company** thus creating excellency with international standing and attractiveness to researchers in a key area of research. The **Austrian consortium can involve also research organisations** in addition to the obligatory Austrian company partner.

- Only **formal employee of CAS** are eligible to submit applications for funding at CAS. For further information, please contact the contact person at CAS listed in Chapter 6.

- The thematic focus of the Cooperative R&D Project has to refer to at least one of the following ICT topics:

  1. Mastering complex ICT solutions: Systems of Systems

  2. Conquering data: Intelligent Systems

  3. Ensuring interoperability: Interfaces of systems

1. Mastering complex ICT solutions: Systems of Systems

Future technological systems will exhibit capabilities to maintain their functionality even under duress, and while their environment is changing. As the complexity of computer systems rises, it becomes even more challenging to guarantee their correctness, e.g. by means of rigorous systems engineering. In such systems, the interaction of components can give rise to new, emerging properties at system level.

The research field **Rigorous systems** engineering concerns the research of new methods and tools to deal with issues such as fault tolerance, verification, validation, formal modelling and formal correctness. Important challenges exist in the certification of systems and subsystems for multiple requirements, and in the efficient use of multicore systems.

Adaptive systems are complex networks of distributed agents that are capable of adapting to changing conditions. Control of such a system is distributed, and its decisions and results are the outcome of interactions among individual agents. Research is necessary in adaptive control- and regulation systems as a precursor to smart, networked and highly parallelised

Cyber-Physical Systems. This addresses also the development of novel architectures that simplify the evolution of existing systems.

Autonomous systems are useful for scenarios that are too dangerous or costly for human operators to enter. Autonomous systems possess a representation of both themselves and the world. They are able to perform tasks without supervision and to modify their behaviour in real time to accommodate unexpected situations or events. Large research questions remain in the fields of autonomy in vehicles and robot systems, ranging from novel hardware components to new programming paradigms.

2. Conquering data: Intelligent Systems

The omnipresent spreading of mobile ICT-devices, the digitalisation of society, the possibilities of 5G and also other factors are catalysts for rapidly growing amounts of user-generated data. At the same time, more and more data is generated and exchanged between machines, e.g. in networks of sensors, or more generally through machine-to-machine communication (M2M). There is also a trend to make more data available to the public and to release data from still closed data silos.

Intelligent data management establishes the connection from raw data to information and knowledge. First and foremost this involves linking and exploiting existing and new data. This task goes far beyond pure search, and rather focusses on implementing innovative services and applications. Usage of new methods like Machine Learning and Computational Intelligence enable new applications.

Research on **Data analysis and integration** improves ways to process and analyse data in any format (e.g. images, video, audio, speech). Some challenges in this area are aggregation and fusion of multimodal or heterogeneous data, as well as novel, efficient and scalable methods for dealing with real-time data (stream) and data complexity and further on the resulting challenges of data extraction and data storage. There is an increasing demand for automatic video and image caption. A universal data management includes the connection from raw data to information and knowledge. The development of efficient algorithms is necessary to process a big amount of data in a short time. This efficiency can for example be provided by parallel algorithms, usage of graphics processing units (GPU), multicore parallel computing or by using shared resources with short load and execution time. Pseudonymization and anonymization must be considered where relevant.

Semantic processing adds structure to data in order to facilitate understanding of and dealing with structured data in multi-faceted ways. This extension of data with semantic

information leads to content-level exploration and to automated processing. Special aims are to de-duplicate data by eliminating redundant data, and to use context information. This and a proper knowledge-extraction and –abstraction enable the **automation of knowledge processes**, including their more efficient, more cost-effective and more ergonomic design. Knowledge creation becomes more and more important also for data intense scientific research. The retrieval of semantic connections and the modelling of semantic connection-networks are of future significance. Another research topic is the improvement of the authentication of multimodal data based on collected background knowledge and considering e.g. privacy.

Cognitive systems model human understanding and human intellect and explore paradigms for cognitive technical systems. Particularly relevant for the programme are contributions to applied cognitive science, e.g. for measuring, modelling and taking into consideration user attention in end user systems ("attention-aware computing"). In this context, video based attention detection, a technology approach which contributes to improving the knowledge transfer process, is relevant. Another recent field of research is deep learning, for example for video and image analysis – a research area that overlaps with data analytics. Algorithms for **prediction** from data (Machine Learning, Reasoning, Decision support) are also relevant, as well as advanced interface technology up to Brain-Computer-Interfaces.

3. Ensuring interoperability: Interfaces of systems

Ongoing digitalisation and strong collaboration in economic life leads to a higher added value, more wealth and a higher standard of living. On the other side, the dependence on information and communication technology (ICT) increases. These ICT-solutions can be obvious, if ICT-tools are used as soft- or hardware. However, the term "ICT-system" includes also ICT-supported systems, mechanisms and processes. The communication and interconnectivity between the components is necessary for the proper operation of these ICT-solutions.

The **Interface** is the part of a system that enables communication. It normally consists of soft- and hardware. Communication pathways do not only cover interfaces within software and within hardware, but also between the two, and not just for the current instant, but also for future, unknown communication partners. A careful development and choice of adequate interface concepts and of **technologies and tools for interfaces** is unconditionally required, in order to minimize friction losses between individual ICT components. New technologies can enable improvements of the information throughput. New methods of the interface design provide the flexible interaction of soft- and hardware (like electronics and photonics).

Substantial technical challenges emerge often when legacy systems need to be integrated in new system environments.

Compatibility makes it possible for users to exchange products from different manufacturers freely and to use them in combination. As an example, in Ambient Assisted Living, different ICT systems in a household must continue to work seamlessly together while undergoing increasing automation, remote control and autonomy. ICT applications with demanding requirements on seamless interaction of components are becoming also more and more important for the provision of health care services with central and de-central medical diagnostics. Man-machine interfaces are equally of growing importance. From a national economic perspective, standardization is important – in particular, compliance with existing standards, as well as the establishment of new standards. It is noted that addressing activities for standardisation in the work packages is possible.

- In general, researchers of both countries should contribute equally to the competence of the partnership. In the partnership researchers of the participating institutions work on a defined research project which is divided into coordinated work packages designed to reach a common research goal. The Joint Proposal provides sufficient level of skill, equipment and manpower capabilities necessary to work on the defined research project.

- The results of the research shall be shared by the participating Austrian and Chinese researchers. All Austrian and Chinese partners involved in the project have to conclude a consortium agreement on issues such as intellectual property rights, liability and confidentiality. **This consortium agreement has to be provided to FFG via eCall and to the headquarters of CAS before the respective national funding contract is signed**.

3. Scope of funding

- FFG is prepared to provide each selected Cooperative R&D Project with financial support for a maximum of 3 years. The **total call budget for the Austrian project partners is 1 Million EURO** (equivalent to around 7.8 Million CNY). Funding applied for an individual project has to lie between 100.000 EURO and 1 Million EURO for Austrian partners within the joint project. The budget provided by FFG can only be used to cover costs linked to the implementation of the project parts executed by the Austrian project partners. Rules for funding of the Austrian project partners are laid down in the respective call documents.[1]

- CAS is prepared to provide each selected Cooperative R&D Project with an annual support, for a total of 3 years. **Each selected project can apply for CAS funding with up to 300.000 CNY** (equivalent to around 38.000 EURO) per year for a total of 3 years. This part of CAS budget is from the CAS international cooperation fund and cannot be spent for personnel costs but just for one or more of the following cost categories:
    - to cover travel costs for Chinese project partners.
    - to purchase consumables necessary for the performance of the CRDP.
    - to cover other spending in accordance with the CAS.

- A minimum **of 10% and a maximum of 80% of the eligible total project costs** have to be carried **by research organisations** (no matter if Austrian and/or Chinese research organisations). **Companies share is a minimum of 20% and a maximum of 90%.**

- Individual enterprises account for a maximum of 70% of the eligible project costs with shares of affiliated companies counting as one enterprise.

- The Austrian and Chinese research organisations must have the right to publish the results of their work that has been conducted in the course of the project.

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[1] The call documents include the Call Fiche, National Call Guideline, Austrian-Chinese Joint Proposal template and further national submission documents.

4. Conditions for funding

- For each CRDP **a joint proposal in English language has to be submitted to FFG and the headquarters of CAS**. The proposal must indicate all Austrian and all Chinese project partners and must clearly lay down the division of work between the partners as laid down in the call documents. The submitted versions of the Joint Proposal have to be identical. Non identical versions are not eligible.

- The Austrian project partners have to submit an Austrian Annex and a cost plan in addition to the Joint Proposal via FFG eCall in due time.

- The Chinese project partners should also prepare and submit in parallel an additional CAS application form in Chinese language to the CAS headquarters (see also below, "Submission of applications").

- **The joint proposals must meet the following goals:**

  - Strengthen the innovation potential of national real assets manufacturing by improving the industry's access to research competences at universities and research organisations.

  - Built up research competences in at least one of the relevant topics in the thematic area of advanced materials stated in section 2 of this document.

  - Increase European and international collaborations and networks and foster cooperations to solve interdisciplinary challenges in research.

- **The joint proposals must meet the following criteria:**

Table 1: Call criteria

1. "Quality of the project" for up to 30 points (Threshold = 18 points)
1.1. How well are the state of the art (level of knowledge/technology) and/or the commercially available products and services described and how plausible is the assessment?
1.2. What is the level of innovation beyond the state of the art and/or existing products and services and how high is the associated risk?
1.3. What is the quality of planning based on the following criteria? • Transparent structure of work packages • Transparent presentation of costs • Transparent description of work packages according to the scope of work • Adequate relationship between costs and work plan • Adequate scope of project management • Provisions for risk management • Realistic implementation of plan (duration, deadlines, milestones, results) • Clarity and coherence of cooperative relationships • Efficient distribution of tasks among the consortium partners
1.4. If the project relates to people[2]: To what extent have gender-specific topics been taken into account in project planning? • Quality of the analysis of gender-specific topics • Integration in the methodical approach of the project
2. "Suitability of the applicant / project partners" for up to 20 points (Threshhold = 12 points)
2.1. Does the consortium have the scientific, technical, economic and management skills required to achieve the project goals?
2.2. To what extent do the consortium partners have the required qualifications and resources to ensure successful implementation of the cooperative project?
2.3. Does the composition of the project team reflect the aim to improve the gender balance in the sector?

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[2] If (groups of) persons are the research object or persons will be affected by the research results, this must be reflected in the research design.

3. "Benefit and exploitation" for up to 30 points (Threshhold = 18points)

3.1. What is the benefit for those applying the project results and the exploitation potential? Different dimensions are relevant depending on the research category:

- For all research categories:
    - Communication of benefits to the relevant target group has been documented in a transparent manner
    - Benefits, advantages or USPs have been described quantitatively and qualitatively and are plausible

- For projects of industrial research (IR)
    - Knowledge increase in the relevant scientific-technical target group

- For projects of experimental development (ED)
    - Users, markets and market segments have been specified and substantiated by turnover figures
    - Turnover potential of the innovation or added value of market growth in relation to the planned project costs
    - Resources required to bring the results to the market

3.2. What is the impact or strategic significance of the project results for the organisations involved? For example by:
- increasing R&D capacities on a long-term basis
- securing or extending their R&D position
- expanding existing R&D activities to include new fields of application
- development of R&D platforms
- opening up new business fields etc.

3.3. How complete and transparent is the exploitation strategy based on the following criteria?
- Quality of exploitation and dissemination strategy for the scientific results
- Quality of exploitation strategy for the economically relevant results
- If persons are affected by the exploitation of the project results: Consideration of gender-specific issues in exploiting the economic potential
- Adequate protection strategy or strategy for ensuring a competitive edge
- Exploitation skills – either in house or via existing contacts and collaborations in relation to
    - dissemination and exploitation of project results (IR)
    - marketing to the planned users (ED)

4.   "Relevance of the project to the Call" for up to 20 points (Threshhold = 12 points)
4.1.   To what extent does the project address the call topics?
4.2.   To what extent does the project contribute to achieving the goals of the call?

4.3.   To what extent does the funding influence the project positively in one or more of the following dimensions?
• Implementation: the funding enables the project to be implemented in the first place
• Acceleration: the funding accelerates implementation
• Scope: the funding increases the scope of the project
• Range: the funding makes the project more ambitious through:
   - a more radical innovation approach
   - higher risk
   - new or extended collaborations
   - long-term strategic orientation

- Funding contracts will be concluded between the FFG and Austrian project partners for the Austrian side and by CAS and the Chinese Institutions for the Chinese side.

- A consortium agreement between all involved Austrian and Chinese partners has to be provided to FFG via eCall and to the headquarters of CAS before the respective national funding contract is signed.

5. Submission of Joint Proposal applications

- **Application in Austria at FFG:**
  Joint Proposal Template - Austrian-Chinese Cooperative R&D Projects must be submitted electronically via <u>FFG eCall</u>.

  Deadline: May 6th 2020, 11:00 Central European Summer Time (C.E.S.T.)

- **Application in China at CAS:**
  Joint Proposal Template - Austrian-Chinese Cooperative R&D Project must be submitted electronically via <u>CAS ARP system</u>.

  Deadline: May 6th 2020, 17:00 China Standard Time (C.S.T.)

- The Joint Proposal must be written in English language.

- In addition applications must fulfill all the respective national and/or general formal conditions for funding in order to be admitted to the evaluation procedure (amendments are not possible).

- The final decision of the selected proposals will be announced not later than October 2020.

6. Contact Information

- **Austria – FFG:**

  More information and the call documents can be found at the FFG website related to the call.

  Submission of application via eCall

  FFG contact persons:

  Anita Hipfinger, Programme Manager

  E: anita.hipfinger@ffg.at, T: +43 (0) 57755-5025

  Peter Kerschl, Programme Manager

  E: peter.kerschl@ffg.at, T: +43 (0) 57755-5022

- **China – CAS:**

  More information and the call documents can be found at the CAS website related to the call.

  CAS contact person:

  Ms. Haihua Gong, Bureau of International Cooperation

  E: hhgong@cashq.ac.cn, T: +86 (0)10 6859-7396