

CODE OF ETHICS AND GOOD PRACTICES IN RESEARCH AND INNOVATION

1. Scope	3
2. Principles and values in RRI	4
3. Good practices	6
3.1 Research integrity	6
3.2 Gender and inclusion perspective	9
3.3 Open access perspective	9
3.4 Public engagement	9

1. Scope

This document establishes the Code of Ethics and Good Practices in Research and Innovation for the Center of Technology and Systems (CTS).

CTS (<https://cts.uninova.pt/>), is a research center recognized by the national (Portuguese) governmental agency for science and technology (FCT).

CTS is a kind of research ecosystem including researchers that have an employment contract with one of the following entities: NOVA School of Science and Technology (a faculty of the NOVA University of Lisbon, to which most members are linked), ISEL/Lisbon School of Engineering, Polytechnic Institute of Setubal, Polytechnic Institute of Beja, and other academic institutions. These members are part of the academic staff of the mentioned institutions, where they teach, but they perform their research activities in the context of CTS as a result of a cooperation agreement.

Research at CTS is typically organized in projects, which are mostly funded by International (e.g., European Commission) and national programs. These projects are usually done in consortia involving academic and industry partners.

As such, each researcher of CTS is subject to various “Responsible Research and Innovation (RRI) spaces”:

- A. Employer’s RRI space: first, he/she must comply with the ethical code and other RRI principles of the employer.
- B. CTS RRI space: then he/she needs to comply with RRI principles of the CTS research ecosystem.
- C. Projects’ RRI space: each time a researcher is involved in a project, he/she needs to comply, during the project duration, with the RRI principles defined by the funding agency for that specific project.
- D. Scientific society code of ethics: finally, most researchers are members of international and national scientific and technical societies (e.g., IEEE, IFIP, IFAC, Socolnet, National Engineers Association) and, as such, need to comply with the code of ethics of such associations.

This document corresponds to the CTS RRI space and thus assuming a complementary role in relation to the ethical code and RRI principles established in the other RRI spaces (defined elsewhere).

2. PRINCIPLES AND VALUES IN RRI

CTS is committed to perform its activities under the widely accepted principles of Research Ethics and Responsible Research. To prevent misconduct and bad practices, the "**European Charter for Researchers**"¹ is followed, namely along the principles and recommendations regarding: Research Freedom, Ethical Principles, Professional Responsibility, Professional Attitude, Contractual and Legal Obligations, Accountability, Good Practices in Research, Dissemination and Exploitation of Results, Public Engagement, Relationship with Supervisors, Supervision and Managerial Duties, Continuing Professional Development, which are transcribed below.

Research Freedom

Researchers should focus their research for the good of mankind and for expanding the frontiers of scientific knowledge, while enjoying the freedom of thought and expression, and the freedom to identify methods by which problems are solved, according to recognised ethical principles and practices.

Researchers should, however, recognise the limitations to this freedom that could arise as a result of particular research circumstances (including supervision/guidance/management) or operational constraints, e.g., for budgetary or infrastructural reasons or, especially in the industrial sector, for reasons of intellectual property protection. Such limitations should not, however, contravene recognised ethical principles and practices, to which researchers have to adhere.

Ethical principles

Researchers should adhere to the recognised ethical practices and fundamental ethical principles appropriate to their discipline(s) as well as to ethical standards as documented in the different national, sectoral or institutional Codes of Ethics.

Professional responsibility

Researchers should make every effort to ensure that their research is relevant to society and does not duplicate research previously carried out elsewhere.

They must avoid plagiarism of any kind and abide by the principle of intellectual property and joint data ownership in the case of research carried out in collaboration with a supervisor(s) and/or other researchers.

Researchers should ensure, if any aspect of their work is delegated, that the person to whom it is delegated has the competence to carry it out.

Professional attitude

Researchers should be familiar with the strategic goals governing their research environment and funding mechanisms and should seek all necessary approvals before starting their research or accessing the resources provided.

They should inform their employers, funders, or supervisor when their research project is delayed, redefined, or completed, or give notice if it is to be terminated earlier or suspended for whatever reason.

Contractual and legal obligations

Researchers at all levels must be familiar with the national, sectoral, or institutional regulations governing training and/or working conditions. This includes Intellectual Property Rights regulations, and the requirements and conditions of any sponsor or funders, independently of the nature of their contract. Researchers should adhere to such regulations by delivering the

¹ https://euraxess.ec.europa.eu/sites/default/files/am509774cee_en_e4.pdf

required results (e.g., thesis, publications, patents, reports, new products development, etc.) as set out in the terms and conditions of the contract or equivalent document.

Accountability

Researchers need to be aware that they are accountable towards their employers, funders or other related public or private bodies as well as, on more ethical grounds, towards society as a whole. In particular, researchers funded by public funds are also accountable for the efficient use of taxpayers' money. Consequently, they should adhere to the principles of sound, transparent and efficient financial management and cooperate with any authorised audits of their research, whether undertaken by their employers/funders or by ethics committees.

Methods of collection and analysis, the outputs and, where applicable, details of the data should be open to internal and external scrutiny, whenever necessary and as requested by the appropriate authorities.

Good practice in research

Researchers should at all times adopt safe working practices, in line with national legislation, including taking the necessary precautions for health and safety and for recovery from information technology disasters, e.g., by preparing proper back-up strategies. They should also be familiar with the current national legal requirements regarding data protection and confidentiality protection requirements, and undertake the necessary steps to fulfil them at all times.

Dissemination, exploitation of results

All researchers should ensure, in compliance with their contractual arrangements, that the results of their research are disseminated and exploited, e.g., communicated, transferred into other research settings or, if appropriate, commercialised. Senior researchers, in particular, are expected to take a lead in ensuring that research is fruitful and that results are either exploited commercially or made accessible to the public (or both) whenever the opportunity arises.

Public engagement

Researchers should ensure that their research activities are made known to society at large in such a way that they can be understood by non-specialists, thereby improving the public's understanding of science. Direct engagement with the public will help researchers to better understand public interest in priorities for science and technology and also the public's concerns.

Relation with supervisors

Researchers in their training phase should establish a structured and regular relationship with their supervisor(s) and faculty/departmental representative(s) so as to take full advantage of their relationship with them.

This includes keeping records of all work progress and research findings, obtaining feedback by means of reports and seminars, applying such feedback and working in accordance with agreed schedules, milestones, deliverables and/or research outputs.

Supervision and managerial duties

Senior researchers should devote particular attention to their multi-faceted role as supervisors, mentors, career advisors, leaders, project coordinators, managers or science communicators. They should perform these tasks to the highest professional standards. With regard to their role as supervisors or mentors of researchers, senior researchers should build up a constructive and positive relationship with the early-stage researchers, in order to set the conditions for efficient transfer of knowledge and for the further successful development of the researchers' careers.

Continuing Professional Development

Researchers at all career stages should seek to continually improve themselves by regularly updating and expanding their skills and competencies. This may be achieved by a variety of means including, but not restricted to, formal training, workshops, conferences, and e-learning.

3. GOOD PRACTICES

Further to the general RRI principles mentioned above, CTS also adopts the following practices.

3.1 RESEARCH INTEGRITY

Authorship

Identifying authors

CTS adopts the IEEE recommendation regarding authorship of publications:

Authorship credit must be reserved for those who met each of the following conditions:

1. Made a significant intellectual contribution to the theoretical developments, system or experimental design, prototype development, and/or the analysis and interpretations of data associated with the work contained in the manuscript;
2. Contributed to drafting the article or reviewing and/or revising it for intellectual content;
3. Approved the final version of the manuscript, including references.

Order of authors

The first author is the one who has made the greatest effort in the research or publication and in the preparation of the first draft.

The rest of the authors can follow according to their degree of contribution and involvement, an order depending on their importance.

It is advisable to establish a communication and authorship plan for research and innovations in advance.

The digital profile of the researcher

CTS researchers should create a digital profile on the main identification platforms involved in their area of research and use the same name on these platforms and in publications.

Currently relevant platforms: Web of Science, Scopus, ORCID, Scholar Google, Ciencia-ID.

Correcting errors and public retraction

When an error is detected that alters the value of the published results, the authors should publish a correction in the same journal or medium as soon as possible.

Publication and research dissemination

Publication channels

CTS researchers shall primarily publish results in highly recognized, prestigious channels:

- *Journals*: indexed in Science Citation Index and SCOPUS, quartile Q1 or Q2.
- *Conferences*: highly recognized conferences, indexed in Web of Science and/or SCOPUS, with evaluation based on the full paper and with an evaluation period of at least 1 month, with an International Program Committee, and proceedings published by an established publisher.

Any other channel should be analyzed carefully regarding its prestige, impact, and refereeing process.

Misconduct in research and publication

CTS considers particularly serious and unacceptable the following practices:

- *Fabrication* - making up results and recording them as if they were real.
- *Falsification* - manipulating research materials, equipment or processes or changing, omitting, or suppressing data or results without justification.
- *Plagiarism* - using other people's work and ideas without giving proper credit to the original source, thus violating the rights of the original author(s) to their intellectual outputs.

Other unacceptable practices include, but are not confined to:

- Manipulating authorship or denigrating the role of other researchers in publications (e.g., ghost authorship - not naming as authors those who did take part in the research).
- Using or supporting gift, guest, or honorary authors - naming as authors those who took little or no part in the research in order to improve the chances research will be published or to increase the perceived status of a publication or to enhance an individual's career development; also, including individuals as authors without their agreement or permission to be named as authors.
- Abuse of power towards research staff in inferior positions (e.g., imposing honorary authorship).
- Re-publishing substantive parts of one's own earlier publications, including translations, with-out duly acknowledging or citing the original ('self-plagiarism').
- Salami slicing – undisclosed duplication of publication - breaking a publication down into least publishable units so as to be able to present a larger number of published titles.
- Citing selectively to enhance own findings or to please editors, reviewers, or colleagues.
- Accusing a researcher of misconduct or other violations in a malicious way.
- Misrepresenting research achievements.
- Exaggerating the importance and practical applicability of findings.
- Delaying or inappropriately hampering the work of other researchers.
- Misusing seniority to encourage violations of research integrity.
- Ignoring putative violations of research integrity by others or covering up inappropriate responses to misconduct or other violations by organisations.
- Establishing or supporting journals and conferences that undermine the quality control of research ('predatory journals / bogus conferences').

Use and acknowledgement of financial resources

The funding and resources made available to CTS researchers shall be used only for the objectives established, unless explicit authorisation is obtained for other uses.

In all publications CTS researchers are required to include affiliation to CTS (in addition to other affiliations) and acknowledgement to related funding organizations (e.g., “Fundação para a Ciência e Tecnologia” with appropriate program reference, other programs / projects with proper reference).

Conflicts of interest

All CTS researchers should openly declare and justify real or potential conflicts of interest in line with the regulations adopted in the scope of each activity.

In most situations a declaration of a conflict of interest, with a brief written record of that declaration, will suffice. However, sometimes a formal declaration according to a specific template might be required by the entities managing certain activities (e.g., projects’ evaluation, publications’ reviewing).

It is acceptable to have a conflict(s) of interest so long as the researcher is transparent about its existence and, where appropriate, takes steps actively to manage the conflict(s) of interest effectively in order that it does not compromise the integrity of the activity.

Reviewing and evaluation

CTS considers improper conduct of its researchers when involved in peer review of research proposals or results (including manuscripts submitted for publication) the following situations:

- Failure to disclose conflicts of interest;
- Inadequate disclosure of limited competence;
- Fraudulent review;
- Misappropriation of the content of material;
- Rejecting a paper in order to suppress a contrary opinion;
- Breach of confidentiality or abuse of material provided in confidence/taking undue or calculated advantage of knowledge obtained during the peer review process).

Monitoring and training

CTS shall create awareness and specific training actions on ethics and RRI for its early-stage researchers, namely PhD students.

Senior researchers in a leading position (e.g., principal investigators) shall contribute to training on ethics and RRI of all researchers under his/her supervision.

Any CTS researcher that is aware of any action of misconduct by other researchers should make an effort to influence a change of behavior and in case of reiterated misconduct inform the Ethics and RRI committee.

3.2 GENDER AND INCLUSION PERSPECTIVE

Regarding gender and inclusion, CTS promotes an equality policy.

In terms of professional contracts, this policy is regulated by the general rules of the country and by the regulations of the main affiliation institutions with which CTS researchers have a contract.

For aspects strictly related to the research activities, CTS will establish a specific Gender and Inclusion Equality Plan.

3.3 OPEN ACCESS PERSPECTIVE

CTS is committed to disseminating its research as widely as possible to improve the public good by accelerating the pace of discovery, encouraging innovation, enriching education, and stimulating the economy. Research outputs from public funding should be shared in a timely and accessible manner to foster social, economic, cultural, and environmental benefits.

As such, CTS recognizes the current importance of the “Open Access” movement and the requirements of funding organizations to have results published in open access.

Nevertheless:

- open access is a complex and changing field that is subject to various negotiation processes with the publishing sector;
- open access often comes with an extra financial cost;
- it is also a “territory” for fast spread of predatory journals and conferences; and
- as a consequence, it is not always understood by researchers.

Therefore, CTS will establish a separate set of Guidelines on Open Access to help its researchers.

CTS also recognises that open access will not be appropriate in all circumstances, for example where disclosure obligations or restrictions apply under Intellectual Property Policy or under a research contract with certain funders.

3.4 PUBLIC ENGAGEMENT

CTS encourages its researchers to communicate with and inform the public about their research, subject to any applicable conditions (for example set by a research funder, a research ethics committee, or a confidentiality agreement with a company); this includes informing the public about negative research results, where the R&I activity has been undertaken to accepted standards of practice. In some area of research (for example some types of health-care research) it is necessary to involve the public in, as well as inform the public about, the research.

Being CTS committed to create societal impact with its research, public engagement is also part of the impact creation process.

Nevertheless:

- Before communicating with the public CTS researchers should attempt to assess the implications of their research for the public (should there be any implications this should guide the timing of, and methods for, communicating research);
- Researchers should pause before making their research openly available online or disseminating research in other ways before independent peer review has taken place, as damage could be done if the research results are found, post-peer review, to be unreliable (however the release of some research data before peer review may be appropriate for public engagement);
- Research results must be checked for their integrity before they are communicated (e.g., limitations of results should be made clear);
- When communicating, researchers must do so honestly, accurately and without bias, distortion, exaggeration, or knowingly misleading the public;
- Researchers are expected to be aware of the limits of their own professional expertise, namely when involved in public discussions;
- Researchers should aim to explain their research in ways that are clearly understood by non-specialists;
- When communicating results, the work of all contributors and collaborators should be properly acknowledged;
- If applicable, potential or real conflicts of interest should be declared;
- Researchers should seek to encourage, and participate in, debate about the issues that their research may raise for society, paying proper consideration to the aspirations and concerns of others.

NOTICE:

The elaboration of this Code was based on the concept, principles, and tools provided in the “ETHNA System Guide”