



D1.1 IPR Requirements

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Executive Summary

Intellectual Property Rights (IPR) management and protection is an important asset of any research and development activity. The corresponding requirements are essential for the successful exploitation of project results and for the avoidance of infringement of already existing IPRs. This document describes guidelines for IPR protection and management on the basis of the HOLDEN Grant Agreement (GA) and the HOLDEN Consortium Agreement (CA), and according to the recommendations given under the Horizon Europe (HE) framework. As such, this document is intended as a guide to support the beneficiaries (the signatories of the GA) with IPR management and protection activities. Binding for the partners are only the rules of HE, the GA, and the CA as signed by the consortium.

The particular goal of this document is to foresee appropriate activities and their implementation mechanisms for the proper protection of intellectual property, which is of particular relevance for the HOLDEN beneficiaries.

The following contents are covered:

- Short introduction of the HOLDEN project and the collaboration partners
- A set of the most relevant definitions and agreements that regulate the IPR
- IPR management and protection activities and corresponding guidelines
- IPR protection measures for the expected results

Table of Contents

Abbreviations	5
1. Introduction	7
1.1. About HOLDEN	7
1.2. Partners	7
2. Intellectual Property Rights Requirements	9
2.1. Basic Definitions	9
2.2. Intellectual Property Rights Management and Protection	10
2.3. IPR protection measures for the expected results	13
3. Summary	15
4. References	16

Abbreviations

Abbreviation	Description
3D	three-dimensional
Aalto	Aalto University
AB	advisory board
CA	consortium agreement
CNR	Consiglio Nazionale Ricerche
EC	European Commission
EPC	European Patent Council
EU	European Union
EUIPO	European Union Intellectual Property Office
EUTM	European Union Trade Mark
FAIR	'findability', 'accessibility', 'interoperability' and 'reusability'
GA	grant agreement
HE	Horizon Europe
IPR	intellectual property rights
HOLDEN	Ethical design of holography in dense wireless networks
NDA	nondisclosure agreement
PC	project coordinator
PID	persistent identifier
RF	radio frequency
ROL	results ownership list
SME	small to medium enterprise

TUM	Technical University of Munich
TWE	University of Twente
WP	work package

1. Introduction

1.1. About HOLDEN

The ubiquitous perception by sensing of objects, subjects and gestures is a pivotal challenge for future technology: it enables personalized services such as smart living, automated logistics or interaction through free-space gestures. However, it also challenges ethical and moral boundaries and threatens privacy. HOLDEN proposes a radically new approach to perception by concisely analysing ethical constraints and privacy risks while re-thinking RF-based sensing. We establish necessary conditions for privacy preserving and ethically compliant sensing and develop new paradigms respecting these constraints.

For the first time ever, HOLDEN constitutes a concentrated effort to explore social aspects of RF-sensing to guide the technological advance and to derive technology for ethically and privacy compliant perception. Central to HOLDEN is the development of ethical and privacy constraints. We use these findings to derive privacy and ethically compliant concepts for RF-based perception. We will develop a system of distributed multi-antenna devices for simultaneous multitarget recognition and ubiquitous perception with unprecedented accuracy, which constitutes a radical paradigm shift from a technology-centric perspective to a privacy-centric one via privacy by design.

HOLDEN achieves this goal along three high risk, complementary, and privacy-centric paths:

Path 1: Continuous-space measurement points: Radio-based 3D vision by holographic image processing of RF wavefronts.

Path 2: Discrete-space measurement points: Advanced 3D beamforming for human-scale recognition and tracking through dense massive connected antenna arrays.

Path 3: Signal processing and learning: High-dimensional tensor processing for the distinction of complex activities and motion from massive-dimensional RF data. The resulting breakthrough approaches and algorithms will be compared against application-level benchmarks via usage scenarios in the fields of logistics, smart living, and free-space

1.2. Partners

The consortium consists of four academic partners and a high-tech SME partner: (a) Aalto University (AALTO), Finland, (b) Technical University of Munich (TUM), Germany, (c) Consiglio Nazionale Ricerche (CNR), Italy, (d) University of Twente (TWE), Netherlands, and (e) Adant (Adant), Italy. This consortium features the specialized and complementary expertise required to achieve the project objectives. AALTO will be responsible for the project management (WP1), covered by an experienced and dedicated project manager. Ethical aspects (WP2), will be addressed by TWE (Prof. Ciano Aydin) who is a pioneer in the field. In particular, eventual gender differences in the ethical perception will be taken into account. TUM pioneered RF holography, which makes TUM (Prof. Thomas Eibert) the ideal leader of WP3. In advanced distributed signal and information processing, CNR has through Prof. Stefano Savazzi and Vittorio Rampa more than 14 years of

experience. CNR will lead WP4. Since more than 10 years, AALTO is active in radio sensing and machine learning based activity recognition. This expertise makes AALTO (Prof. Sigg) the ideal leader of WP5. Adant (Daniele Piazza) will contribute to the market analysis, application possibilities, and validation (WP6). Led by AALTO, dissemination with the website as one the media will be addressed by all partners. All academic partners are committed to early publication of results, e.g., via arXiv (open science).

2. Intellectual Property Rights Requirements

Intellectual property rights (IPR) management is the process of effectively identifying, characterizing, structuring, and sharing IPR, which is relevant for a certain activity. In HOLDEN, the goal is to provide the best use of the IPR generated in different work packages within the consortium. As such, relevant existing IPR needs to be identified and effectively utilized, where infringement of existing IPR must be avoided. Relevant results produced within the activity must be identified, appropriately protected, and exploited.

This will happen based on the rules defined in the HOLDEN GA [1] and CA [2], together with the general rules and recommendations for the HE Programme. The GA establishes the rules between the European Commission and the HOLDEN consortium partners. The GA number 101099491 [1], Article 16 (Intellectual property rights (IPR) – background and results – access rights and rights of use), defines the rules for the ownership of IPR, their handling, and their use. All consortium partners (the coordinator and four other beneficiaries) are signatories of the GA. Prior to the project start, the project participants entered into a formal CA [2] that defines the legal basis for the sharing of rights, mutual obligations, and responsibilities. The HOLDEN CA is based upon the DESCAs model consortium agreement for HE as amended by Aalto University. The CA further defines and specifies relevant IP arrangements, in full compliance with the provisions given in the GA.

2.1. Basic Definitions

IPR-relevant key terms in the context of HE projects are: background, results, and access rights.

In the following, some definitions of terms relevant for IPR management and protection as specified in the GA [1] and the CA [2], are summarized:

Background means any data, know-how or information — whatever its form or nature (tangible or intangible), including any rights such as intellectual property rights — that is:

- (a) held by the beneficiaries before they acceded to the agreement and
- (b) needed to implement the action or exploit the results.

Results means any tangible or intangible effect of the action, such as data, know-how or information, whatever its form or nature, whether or not it can be protected, as well as any rights attached to it, including intellectual property rights.

Access rights — Rights to use results or background.

Dissemination — The public disclosure of the results by appropriate means, other than resulting from protecting or exploiting the results, including by scientific publications in any medium.

Exploit(ation) — The use of results in further research and innovation activities other than those covered by the action concerned, including among other things, commercial exploitation such as developing, creating, manufacturing, and marketing a product or process, creating and providing a service, or utilization in standardisation activities.

Fair and reasonable conditions — Appropriate conditions, including possible financial terms or royalty-free conditions, taking into account the specific circumstances of the request for access, for example the actual or potential value of the results or background to which access is requested and/or the scope, duration or other characteristics of the exploitation envisaged.

FAIR principles — ‘findability’, ‘accessibility’, ‘interoperability’ and ‘reusability’.

Open access — Online access to research outputs provided free of charge to the end-user.

Open science — An approach to the scientific process based on open cooperative work, tools, and diffusing knowledge.

Research data management — The process within the research lifecycle that includes the organisation, storage, preservation, security, quality assurance, allocation of persistent identifiers (PIDs) and rules and procedures for sharing of data including licensing.

Research outputs — Results to which access can be given in the form of scientific publications, data or other engineered results and processes such as software, algorithms, protocols, models, workflows and electronic notebooks.

2.2. Intellectual Property Rights Management and Protection

Annex 5 of the GA [1] contains and defines the “Agreement on background”, the “Ownership of results” including joint ownerships, the “Protection of results”, the “Exploitation of results”, the “Transfer and licensing of results”, and the “Access rights to results and background”.

As such and in agreement with the HE rules, protection, dissemination, and exploitation of project results is mandatory for all beneficiaries, by:

- a) using the results in further research activities (outside the action);
- b) developing, creating, or marketing products or processes;
- c) creating and providing services;
- d) using the results in standardisation activities or other use scenarios such as to inform policy or for educational purposes.

Exploitation is by no means limited to commercial exploitation.

In particular, the GA states: “If, despite a beneficiary’s best efforts, the results are not exploited within one year after the end of the action, the beneficiaries must (unless otherwise agreed in writing with the granting authority) use the Horizon Results Platform to find interested parties to exploit the results.

If results are incorporated in a standard, the beneficiaries must (unless otherwise agreed with the granting authority or unless it is impossible) ask the standardisation body to include the funding statement (see Article 17) in (information related to) the standard.”

It is agreed on that the beneficiaries follow a decentralized IPR-management, protection, dissemination and exploitation strategy. Each beneficiary undertakes its own IPR-management, protection, dissemination, and exploitation activities.

In the EB meetings, status reports on relevant results, its protection, dissemination, and exploitation will be given on a regular basis. The mandatory results ownership lists (ROLs), which must be provided with the project reporting, will be discussed in order to develop an agreement on ownerships, in particular in the case of joint ownerships. Corresponding strategy discussions will help to develop and improve the process of IPR protection, dissemination, and protection. In the event of conflicts or ill performance, appropriate steps, including shift of resources, are decided by partner representatives. In the democratic decision process, the PC has a 2nd vote in case of a tie.

During the course of the HOLDEN project (and in particular at the beginning), thorough IPR and literature studies (in particular on patents) will be performed, in order to build on already available knowledge and in order to avoid infringement of existing IPR.

The CA [2] can be considered as a written agreement among the project partners on the results ownerships, including joint ownerships, the transfer of results, the dissemination of results, including unpublished results or background, as well as the use of names, logos, trademarks, and access rights. As such, all partners agreed on rules with respect to IPR ownership, access rights to results, and background towards the project execution and protection of IPR, and confidential information.

Attachment 1 of the CA [2] identifies relevant background of the project partners brought from other activities into the HOLDEN project at the time of signing the CA. Anything not identified in this Attachment 1 is not the object of access right obligations regarding background. The project partners may add additional background to Attachment 1 during the project in accordance to the protocol defined in the CA (Section 9, Subsection 9.1, Subsubsection 9.1.2). If the knowledge is evidently a part of the public domain, it is not needed to be registered or access rights granted.

“New” or so-called “foreground” knowledge represents results obtained in the HOLDEN-project, by one partner alone or in cooperation with other partners. HOLDEN results are owned by the project partner who generates them. In accordance to the GA, project partners who have contributed jointly to the results generation/development will have joint ownership of this work if it is not possible to establish the respective contribution of each beneficiary, or separate them for the purpose of applying for, obtaining or maintaining their protection.

The project partners have agreed to grant non-exclusive, royalty-free access to background and foreground to each other for the execution of the project. Access rights will also be free of any administrative transfer costs. The granting of access rights has been made conditional on the acceptance of specific conditions aimed at ensuring that these rights will be used only for the intended purpose and that appropriate confidentiality obligations are in place. Results and background will be used only for the purposes for which access rights to it have been granted. Further details on access rights policies are outlined in the CA Section 9.

The project partners must promote the action and its results, by providing targeted information to multiple audiences (including the media and the public) in a strategic and effective manner. The project partners are committed to provide free open access to project research data following FAIR principles. In a similar manner, the project partners are encouraged to mutually share their knowledge for efficient accomplishment of the HOLDEN objectives, including background and

foreground granted in accordance with the CA to the extent as needed for the successful implementation of the action.

An initial anticipation of the project results is incorporated in the Description of the Action (Annex 1 of GA), and the envisaged results are in particular discussed in Section 1 (Introduction). During the project implementation, research results will be generated by all partners. The results will be properly identified and recorded.

The decision on the most suitable form of IPR protection is strongly dependent on the type of results and the overall dissemination and exploitation strategy, which can of course be different for every partner. Project results should be disseminated as soon as possible and by appropriate means. Any results that are capable of commercial or industrial exploitation should be protected before any dissemination activity, where this will be a matter of discussion between the partner representatives within the EB meetings, particularly in the case of joint ownership.

Any draft of a scientific publication, conference paper or poster, article, or other intention to present project results in the public domain (via an interview, news brief, internet posting, etc.) will be communicated to all partners at least 30 days in advance of any submission to a publishing body or instrument, and any partner may object within 21 days if legitimate interests are significantly harmed. The EB will advise on the appropriateness of such a publication and recommend suitable amendments to the information where it deems necessary.

In the case where confidential information should be discussed outside the consortium (for instance, during the meetings with AB members) NDAs will be signed in compliance with the CA (Attachment 5).

The project partners agree with the open science practice in order to achieve wide visibility and large impact. For scientific publications in open access journals, the licensing scheme of the publication repository should be followed.

The dissemination and exploitation activities will continue after the end of the project.

2.3. IPR protection measures for the expected results

Any valuable project results should be protected. Protection is not obligatory in any case, but the decision not to protect project results should preferably be made in consultation with the other project partners, who may wish to take ownership. If valuable project results are left unprotected, the European Commission (EC) may take ownership.

Where project results are capable of industrial or commercial application (even if further research and development, and/or private investment is needed), it should be protected in an appropriate manner in conformity with the relevant legal provisions, having due regard to the legitimate interests of all project partners, in particular the commercial interests of the other partners. Even though a decentralized IPR management and protection strategy is followed, the project partners should reflect on the best strategy to protect their results in view of the utilization of the results both in further research and in the development of commercial products, processes, or services.

The most appropriate IPR protection measure for a certain project result depends on many aspects, in particular on the character of the result, and on the exploitation and dissemination strategies of the result owner(s).

The following IPR protection measures may be considered:

A **patent** is a legal title that can be granted to any invention having a technical character [3]. Article 52(1) of the European Patent Council (EPC) outlines four basic requirements for patentability [4]:

1. There must be an invention, belonging to any field of technology.
2. The invention must be susceptible of industrial application.
3. The invention must be new.
4. The invention must involve an inventive step.

Thereby, the EPC excludes certain subjects from being patentable, including discoveries, scientific theories, and mathematical methods as well as programs for computers [5].

Patents are territorial rights and limited in time. Patent protection may therefore require large effort and high costs, especially if protection in many countries is needed and if the protection is needed for a long time.

Copyright is the rights granted to authors, creators, performers, producers, or broadcasters of original works [6]. Copyright law in the EU remains essentially a national law. However, national rules are gradually converging through international treaties and EU legislation [7]. Software copyright protection is regulated by the Computer Programs Directive (Directive 2009/24/EC), including those which are incorporated into hardware.

The protection by copyright lasts for the lifetime of the author and 70 years after his/her death [8]. During this time, European copyright law provides the right to authorize or prohibit reproduction and any communication to the public (including online distribution of works), with licensing being the main mechanism for the exercise of copyright and related rights [6].

Protection with a **trademark** provides the owner with the exclusive rights to commercially use a sign, design, or expression that identifies or describes a product and helps differentiate it from

competitors [8]. Trademarks allow the owner to appropriate the financial returns of new or existing products. Hence, they play an important role in the marketing of innovations [8].

In the EU, trademarks can either be registered at a national level at the national IP offices, or at a EU level as a European Union Trade Mark (EUTM) at the European Union Intellectual Property Office (EUIPO) [9, 10].

The **utility model** was introduced as a “petty patent” in some countries to provide a cheaper but simpler alternative to patent protection. Utility models are usually granted without substantive examination [11]. Due to the simpler process, utility models are in particular attractive to industries with short product life cycles [12]. Utility models can be obtained for less inventive steps (incremental upgrades and adaptations of existing products), can be registered faster and are less expensive to acquire and to maintain than patents. Compared to patents, however, they have a shorter protection term and provide reduced legal protection [13].

Confidentiality, or **trade secrets**, are valuable pieces of information which give companies or institutions a competitive advantage. Companies develop new information, such as new manufacturing processes, updated recipes, etc., that helps them to perform better, faster, or at lower cost [14]. These types of information or knowledge assets, which can typically not be protected by patents or other IPRs, are usually protected by secrecy. The Directive (EU) 2016/943 aims to standardise the national laws in EU countries against the unlawful acquisition, disclosure, and use of trade secrets [15].

Any confidential information as relevant within the HOLDEN project should be identified and labelled as such, if possible. Among the project partners and the EC, it is understood that any confidential information is kept confidential. If it becomes necessary to pass any confidential information to third parties (for instance, also during the meetings with Advisory Board (AB) members), appropriate nondisclosure agreements (NDAs) shall be implemented and signed in agreement with the CA [2]. In certain situations, where specific protection of confidential information is considered inappropriate, it may even be beneficial to consider protective publication of such information.

3. Summary

The relevant IPR management and protection rules have been defined and agreed on by the project partners in the GA and CA. Based on these rules, relevant background and existing IPR has been identified and will be updated continuously during the project. Appropriate IPR management strategies and measures have been outlined in order to support the best possible protection, dissemination, and exploitation of the results produced during the HOLDEN project.

4. References

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