THEME [SC1-DTH-03-2018]

Adaptive smart working and living environments supporting active and healthy ageing

BIONIC
body information on an intelligent chip

„Personalized Body Sensor Networks with Built-In Intelligence for Real-Time Risk Assessment and Coaching of Ageing workers, in all types of working and living environments"

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Table 1: List of Abbreviations

Term / Abbreviation	Definition
DFKI	Deutsches Forschungszentrum für Künstliche Intelligenz
TUK	Technische Universität Kaiserslautern
IBV	Instituto de Biomecánica de Valencia
RRD	Roessing Research and Development
UPRC	University of Piraeus Research Center
IAW	Interactive Wear AG
HIKE	Hypecliq IKE
AC	Acciona Construcción
MTU	Rolls-Royce Power Systems - MTU
BAUA	Bundesanstalt für Arbeitsschutz und Arbeitsmedizin
FLC	Fundación Laboral de la Construcción
IPR	Intellectual Property Right

1   EXECUTIVE SUMMARY

The deliverable D8.2 with the title "IPR Agreement" contains the first version for of the consortiums IPR handling. It is planned as intermediate step before the final IPR Agreement planned for the end of the project.

The current deliverable lists and describes the developed Intellectual Properties (IPs), their ownership and provides information about the handling policy of the concerned partner(s).

This document is complementary to the Cooperation Agreement (CA) signed by the consortium members in January 2019 and regulating the Intellectual Property rights (IPR) from a legal point of view.

2   INTRODUCTION

The handling of IPR is a crucial aspect of any research project with a large number of contributors. Especially this project by its nature involves common development which are carried out by different institutions.

The current deliverable should initiate at early stage of the project the discussion on the possible upcoming IPR handling. Although several developments can be considered relevant today, only a few of them will be of relevance in the future, mainly depending on the commercial exploitation strategy.

The goals of the deliverable are to collect possible joint developments and show methods about how to handle the contributions from all partners properly. It is considered as a working document towards the final version at the end of the project.

3   IPRS CONSIDERATION IN THE BIONIC PROJECT

3.1   IPR CONCEPT WITHIN BIONIC

In the environment of international applied high-level research projects, the careful handling of IPR issues is of strategic importance. Due to the fact, that many persons in numerous organisations cooperate across national borders within these research projects in order to develop novel technologies, concepts or processes, exchanging information with other parties is essential.

Also the information transfer towards the project-external parties requires a due diligence with regard to the valuable resources knowledge. These activities do not only affect the cooperation within the official project duration but also the project start-up phase with its project preparation and negotiation activities and the period after the official end of the project and its exploitation of results. All these activities with regard to IPR issues aim to create a favourable environment for respecting intellectual property rights (IPR) because of moral and economic reasons.

Without the protection of IP the joint creativity of natural persons or legal bodies as well as the dissemination and exploitation of results would be highly restricted not to risk a substantial drain of knowledge. Confidentiality agreements or, better, "Non-disclosure Agreements" (NDA) aim to prevent information shared by one individual/organisation with another being disclosed to a third party without prior consent.

Intellectual Property (IP) is an intangible asset that is being created as a result of intellectual creative effort of human mind in relation to works of authorship and/or inventions. With the ownership of intangible assets certain legal exclusive property rights which are established by law or by contractual obligation are connected and maintain the control in relation to the protection of the interests of the

creators by excluding these creations from public property. This means the right to permit or deny the use and exploitation of the creative work. So IPR provides a protection of the creations and inventions to the owners by preventing users of using or copying them without reservation or payment for a certain period of time.

Within the BIONIC project the IPR protection must be applied to cover various types of interactions among partners, as described below. For each of the interaction type, a typical IPR documentation is given.

- Exchange of information and knowledge regarding scientific results and discoveries (e.g. a novel algorithm to solve a specific technical problem). This IP are creations of human minds of the project partners as a result of significant investment of tangible and intangible resources (e.g. manpower, equipment, financial resources, time, experiences and last but not least knowledge).
- Unilateral or Multilateral NDA: Provide mutual access to a high number of commercial products, devices, software modules, in order to build joint demonstrators within the BIONIC project. Proper documentation (not public) is also concerned.
- Unilateral (Multilateral) NDA and/or License Agreement (LA): it provides licensing of development and/or measuring/evaluation/simulation tools, both in the status of commercial products and in the status of beta release or academic tool (e.g. not primarily intended for commercialization)
- Unilateral NDA (for non-commercial products)
- License Agreement (for commercial or pre-commercial products)

The management of intellectual property in research projects like BIONIC is already important at the project start where the first development of appropriate ideas for the joint research activities and the assembling of the project consortium take place.

In order to guarantee a uniform approach by the project participants, internal commonly agreed rules have been defined, including confidentiality clauses for the use of dissemination of results, which can be incorporated in the CA.

The next section explains IPRs prerequisites for the project with the focus on their implementation in the BIONIC project.

3.2   BIONIC CONSORTIUM AGREEMENT

The project Consortium Agreement is signed between the project participants of the consortium, establishing provisions related mainly to consortium management, the distribution of the financial contribution and IP. The Consortium Agreement is a negotiated and agreed mandatory contract between the project partners, which has to be signed by all partners. It includes guidelines for the project internal management of the cooperation by providing rules for the following issues:

The parties' obligations

- Project internal organisation and project structure (project bodies and their functions, rights and duties, voting regulations)
- Provisions about the ownership and licensing of intellectual property (e.g. foreground, publications, access rights, dissemination of results)
- Handling of matters of liability and confidentiality
- Procedures for settling internal disputes
- Handling of defaults and remedies (exclusion/withdrawing)

More specifically, the Consortium Agreement covers additional sections which (as described below) are related to IPR and define internal rules including confidentiality clauses for the use and dissemination of results. Knowledge, or foreground, generated within the project will be protected by patent filing or publication in accordance with the consortium agreement that also represents an outline contract between the partners. The status of background and side-ground brought in or developed in parallel is also be covered by the Consortium Agreement. Amendments to the Consortium Agreement can be done on a per partner basis as the needs for knowledge and protection varies between the partners.

4 OWNERSHIP

The following chapter summarizes   possible contributions   to IPRs of each   partner and the corresponding work packages. The list is constantly modified and considered to give an overview at the date of the deliverable.

4.1 ASSETS DEVELOPED WITHIN THE PROJECT BIONIC

4.1.1 Hardware, invention, technology and product design

Partner invention	Patent	Utility Model	Industrial Design	Copyright	Trade Mark	Confidential Information
Hardware and Firmware and Procedures for synchronized on body sensor data acquisition developed by **DFKI**	Patent Nr. 10 2013 109 445,7 "Messeanordnung zur Erfassung von Körperbewegung" of Dr. Norbert Schmitz					
DFKI Embedded Linux Server Application for configuration, monitoring and plugin-based processing of the BSN sensor data						
Statistical morphotypes obtained from 3D body databases by **IBV**						

4.1.2   Software

Partner Invention	Patent	Utility Model	Industrial Design	Copyright	Trade Mark	Confidential Information
DFKI Smart phone app for configuration and monitoring of BSN via BLE						Source code
DFKI Android wear OS app for displaying notifications, interaction with the BSN and ingesting heartrate data to the BSN						Source code
DFKI Browser based API and User Interface for End User Application running on the BSN						Source code
Smart phone app for registering two images of user body (front view and side view), required for generating customised 3D body morphotype by **IBV**						Source code

4.1.3   Methods

Partner Invention	Patent	Utility Model	Industrial Design	Copyright	Trade Mark	Confidential Information
TUK A decentralized method for real-time kinematics estimation of the full body or parts of the body implemented in software						
TUK Methods for self-calibration						
TUK The combination of TUK decentralized algorithm with the DFKI hardware						
TUK Compensating artefacts from loosely coupled sensors and load estimation from IMU based kinematics and pressure insole data						
Methods for orientation estimation and sensor calibration based on MIMU sensor data developed by **DFKI**						
Procedure for Bluetooth Low Energy based accurate time synchronization on Nordic Microcontrollers						

developed by **DFKI**						
Procedures developed by **IBV** for assessing ergonomic risks (included in Ergo/IBV tool)						
Procedures developed by **IBV** for assessment of workers functional capacities (included in Nedlabor/IBV tool)						

4.1.4   Dissemination (website, videos, articles, template)

Partner Invention	Patent	Utility Model	Industrial Design	Copyright	Trade Mark	Confidential Information
FLC Workshop participating recruitment						Data contact and position at their companies. Probably signed in the workshop development.
FLC Survey participating recruitment						Only an e-mail address. The survey included a disclaimer and it is anonymous.
DFKI BIONIC Logo						
DFKI BIONIC web address						

5   IPR MANAGEMENT

IPR management defines the procedures for managing IPR in respect of software developed and used within BIONIC. Project managers and developers responsible for software development and release need to decide what software they can use (background, foreground or 3rd party) and how software they are developing can be used by others. The principles for IPR management in respect to software is defined with the CA.

The main driver behind procedures is to ensure that results can be exploited in ways that the consortium wishes. To do this, it is necessary to ensure that the ownership of assets (or software), and the intellectual property rights (the constraints) associated with it are consistent with the project's exploitation plans.

The protection of intellectual property rights makes it possible to distribute or publish software without losing control over the intellectual property contained within it. You can then exploit your intellectual property by licensing to others to do specific things that a patent/copyright would otherwise prevent them from doing. Note that a license does not prevent people from doing anything – it only gives them permission to do certain things. It is important that developers do not remove copyright statements or use licences that surrender copyright or assign it to a recipient. If copyright is surrendered then the software becomes public domain, and anyone can do what they like with it. If you assign copyright to a recipient then they can do what they like with the software, and they will be able to control the licensing of the software and its use by others --- including the assignor.

Software Licences define what the license is allowed to do in respect of the following:

- For what purpose can the software be used – e.g. is it restricted to evaluation or research?
- How can the software be used – e.g. is it restricted to a single individual, can it be used over a network?
- Is the licensee guaranteed access to the source code?
- Can the software be altered, or combined with other software, and under what conditions?
- Can the software be supplied to others, and on what terms?

In recent years, a large amount of software has been made available under open source licences. These normally guarantee access to source code, and allow it to be adapted and/or supplied to others. Some developers seem to think this means open source software can be used or extended in any way they want, but this isn't the case – open source software is usually not public domain, and you may not do anything that contravenes the originator's copyright except where allowed by the licence.

In order to use copyright to protect IPR, BIONIC is concerned with the status of documents we produce. BIONIC has to keep track of the following attributes of each document.

- Which project participant produced it and when?
- Was it produced in the project or not?
- What terms apply to the document – stemming from the software licences, the project contract, or other agreements?
- What other documents (if any) are needed to use or exploit it – and how does this constrain the terms or modes of exploitation?

The way BIONIC handles this is to comment every source code document (including e.g. a properties file) to indicate its origin and dependencies, including which organisation produced it and for which

project. To keep track of all the software created in the project, BIONIC uses these header comments to show how each individual software document was generated, and maintain an overview at project level via a software intellectual property register. The intellectual property register is just a list of software modules or components associated with the project. It gives:

- the name of the module or component;
- the organisation that developed it and owns the copyright;
- whether it is project foreground or background;
- the participant that introduced it, and the licence under which they acquired it;
- where it can be obtained by others and under what licence; and
- the terms (e.g. licence) under which it can be distributed by the project.

Developers do not use any software (except non---essential development tool) that isn't on the register. If a developer wishes to use or incorporate software that isn't on the register, they collect the necessary information (including any software licences) and send it to the maintainer of the register for inclusion. The registry maintainer compares any licence constraints with the project constraints (within and beyond the lifetime of the project), decide whether to add the software to the intellectual property register, and inform the developer who made the request so they know whether they can use it.

The register maintainer needs to have a good understanding of the project exploitation plans and frequently used software licences, so that these decisions can be made quickly in most cases. In some cases, there may be unresolved exploitation issues that must be considered by the project board over a period of weeks or months. In this case, the developer is informed immediately, and told not to use the software until a decision has been made to allow it.

The consortium has to analyse licenses, whether they are permissive, compatible, and restrictive. They have to pay special attention on possible issues of BIONIC modules due to licenses of 3rd parties components. Also the dependencies between different BIONIC modules have to be analysed.

6 CONCLUSION

The IPR agreement D8.1 is in a very early state and will be updated in the future every 12 months. Although several possibly IPR related issues have been identified, a more detailed discussion has to be initiated. The current state of the project forced the consortium to pay more attention on the technical development and management, which lead to the fact that the current document is basically an intermediate step towards the final agreement.

7 SOURCES

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2. https://www.aquality-etn.eu/wp-content/uploads/2018/06/IP_Management_MSCA_Webinar.pdf