D7.6 First Open Access Data Release

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3D-games for TUNing and lEarnINg about hearing aids

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Work Package WP7

Authors: Picinali, L., Wedekind, G.
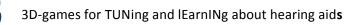
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Abbreviations and Acronyms

3DTI	3D Tune-In
DMU	De Montfort University
D	Deliverable (e.g. D7.1 -> Deliverable 7.1)
EU	European Union
GN	GN Hearing
ICL	Imperial College London
M	Month (e.g. M12 -> Month 12)
NLK	Nerlaska, S.L.
Reactify	Reactify Music
SME	Small and Medium-sized Enterprise
UMA	University of Malaga
UNott	The University of Nottingham
VIA	Vianet
WP	Work Package
XTeam	XTeam Software Solution

Executive summary

This is the public deliverable D7.6 First Open Access Data Release, of the H2020 project 3D Tune-In (ICT - 644051). This work was carried out as part of WP7 Project Management.

3D Tune-In (3DTI) takes part in the Open Access Research Data Pilot which aims to improve and maximise access to and re-use of research data generated by projects. D7.9 – Data Management Plan (Picinali & Wedekind, 2015) submitted in October 2015, outlined the project's approach towards making research data available in the public domain. D7.6 – First Open Access Data Release describes the content and location of the first release of open access research data within the 3D Tune-In project in M12, and will be followed by further releases in M24 (D7.7) and M36 (D7.8).

Section 1: INTRODUCTION

This is the public deliverable D7.6 First Open Access Data Release, of the H2020 project 3D Tune-In (ICT - 644051). This work was carried out as part of WP7 Project Management.

As outlined in Article 29.3 of the 3DTI Grant Agreement, beneficiaries must deposit project data in a research data repository and take measures to make it possible for third parties to access, mine, exploit, reproduce and disseminate data free of charge.

Data includes associated metadata needed to validate the results presented in scientific publications, and any other kind of data as specified in the Data Management Plan (DMP) outlined in deliverable D7.9 (Picinali & Wedekind, 2015). Moreover, beneficiaries must provide information (via the repository) about tools and instruments necessary for validating the results (and - where possible - provide the tools and instruments themselves).

This does not change the obligation to protect results, adhere to confidentiality and ethics considerations, security obligations or the obligations to protect personal data. As an exception, beneficiaries do not have to ensure open access to specific parts of their research data if this can compromise the achievement of the action's main objectives, as described in Annex 1. In this case, the data management plan must contain the reasons for not giving access.

Following D7.9 (Picinali & Wedekind, 2015), this deliverable describes the first open access research data release within the 3D Tune-In project. The project's approach towards data management is outlined in close accordance with the EU's Guidelines for Data Management (**http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hoa-data-mgt_en.pdf**).

Section 2: Data Types and Repositories (from D7.9)

For simplifying the reading of this report, and avoiding having to refer continuously to another document, the following section from D7.9 – Data Management Plan (Picinali & Wedekind, 2015) has been repeated.

3D Tune-In will produce four types of data (D1-2-3-4) to be included in the Open Access Research Data Pilot.

2.1: Software (D1)

The software production of 3DTI is divided in three separate stages. Firstly, all partners will work towards the creation of a 3D Tune-In Toolkit, which will comprise 3D audio and video engines, a haptic engine, hearing aid emulators, evaluation tools, human-computer interfaces and game scenarios. The Toolkit will then be used to create 5 separate applications - each application will be linked with a specific commercial partner, and will involve all the academic partners.

D1.1   The Toolkit will serve as a basis for building specific applications, and will be shared as open source software. Once ready, the Toolkit, including relevant documentation, will be made available to the public, as described in Sections 3 and 4 of this report.

D1.2   In order to address the concerns of the commercial partners related to sharing sensitive information about their products and services (e.g. GN Hearing sharing sensitive information about their hearing aid devices) and potential clashes in the market in terms of competitors having similar tools, the 3DTI applications will not be open source, and will not be part of the Open Access Research Data Pilot.

D1.3   During the project, several demonstration and testing platforms will be created. These will include simple interfaces to use the Toolkit, testing platforms to evaluate its various functionalities, and tools/interfaces for demonstration purposes. These, including relevant documentation, will be made available to the public, as described in Sections 3 and 4 of this report. Data will be made available to the public in accordance with the needs of 3DTI's exploitation strategy and legal framework(s) of the Applications and Toolkit.

2.2: Subjects' data (D2)

Within 3DTI three separate activities will be carried out in which individuals will be involved for evaluation and testing purposes.

D2.1   Qualitative analysis for the participatory design stage (WP1).
D2.2   Quantitative analysis for the technical development stage (WP2).
D2.3   Quantitative and qualitative analysis for the evaluation stage (WP4).

Considering the sensitive nature of this data type, special attention will be put in sharing it with the general public. In particular, data in which individuals could be potentially recognised (e.g. quantitative analysis for the participatory design and evaluation stages) will not be included in the Open Access Research Data Pilot. However, it is important to note that, once data has been anonymised, it would be not possible to be withdrawn. Participants can withdraw from a study at any time (as stated in the consent form) but by providing consent and completing the study/questionnaire they have agreed for their data to be anonymised and used for the research. Data can only be withdrawn if it can be linked to a specific participant. Advice from the Quality

Manager, Ethics Coordinator and external Ethics Advisor will be sought before making public any data within this category (D2).

2.3: Scientific publications (D3)

All scientific publications produced within the 3DTI project will be included in the Open Access Research Data Pilot where this does not contravene any copyright issues and will be made publicly available.

2.4: Dissemination material (D4)

All dissemination material produced within the 3DTI project will be included in the Open Access Research Data Pilot, and will be made publicly available.

2.5: Data Repositories

3DTI will employ two separate data repositories in order to comply with the Open Access Research Data Pilot.

Before the public release (schedule in Section 4), every partner will be responsible for archiving the data they produced on local hard-drives, which will be regularly backed up: each partner has the obligation to conduct a monthly back-up of all analysis data and resources produced during the project lifecycle.

2.5.1: Website (DR1)

The 3DTI website (http://www.3d-tune-in.eu) is online since July 2015, and contains an *Open Access Research Data* section, as well as a *Downloads* section. The 3DTI website will be locked at the end of the project (May 2018), and will be kept available at the same URL for 7 years after that date (10 years from the project start date).

2.5.2: Zenodo (DR2)

*Zenodo (*http://zenodo.org/*) is an open dependable home for the long tail of science, enabling researchers to share and preserve any research outputs in any size, any format and from any science*.

An account in Zenodo will be created for 3DTI, and the repository will be used for sharing 3DTI data.

Section 3: M12 Open Access Research Data Release

The following data has been released in DR1 and DR2 within the first 12 months of the project.

3.1: D1.3 - Demonstration and testing platforms, with documentation

Within T1.3 - Specification of 3D Tune-In Toolkit - research has been carried out at Imperial College London investigating the effect of training on localisation accuracy with non-individualised Head-Related Transfer Functions (HRTFs). Here follows a brief description of the research:

The ability to accurately pinpoint the location of a sound in 3D space depends on acoustic cues that are highly specific to each individual. These acoustic cues represent the way the shape of the individual's body and ears transform the sound in a direction-dependent fashion, known as HRTF. This form of accurate sound localisation would be highly desirable for consumer audio applications (and indeed there are many products that attempt to provide it with limited success), but measuring individual HRTFs is too expensive and time consuming for commercial applications. Earlier research has shown that, with time, it is possible for an individual to learn to localise with modified HRTFs, however it takes approximately one month of continuous exposure putting it again beyond the realm of commercial applications. The aim of this research is to test the hypothesis that by exposing participants to non-individual HRTFs in the context of a computer game in which accurate sound localisation is essential to succeed, this training period could be dramatically reduced thanks to the rapid learning that is often observed in computer game contexts thanks to factors such as rapid feedback, player engagement, etc.

Within the D1.3 folder, a README.txt file has been created describing the sub-folders content, which is outlined in the following sub-sections.

3.1.1: Testing platform and documentation
Within this category, the following data has been released:

- Description of the experiment protocol
- Description of the Open Sound Control protocol
- Unity files
    - Assets
    - Project Settings
- Matlab m-files
- Stimuli (target and SFX)

3.1.2: Anonymised subject data
Within this category, the following data has been released:

- Format specification
- Individual anonymised subject data

3.1.3: Analyses
Within this category, the following data has been released:

- Individual summary
- Pooled summary

3.2: D3 - Scientific publications

Three scientific publications have been made in the first 12 months within the 3D Tune-In project:

- [Conf 1.1]   Picinali, L.; D'Cruz, M. & Simeone, L. – on behalf of the 3D Tune-In consortium (2015). 3D-Tune-In: 3D sound, visuals and gamification to facilitate the use of hearing aids. In Proceedings of the EuroVR 2015 Conference, Lecco, Italy, October 2015.
- [Conf 1.2]   Steadman, M. & Picinali, L. (2016). A mobile-based platform for evaluating localisation of virtual sound sources. Poster presented at the 2016 Workshop on Auditory Neuroscience, Cognition and Modelling, London, February 2016.
- [Journ 1.1]   Eastgate, R., Picinali, L.; Patel, A.; D'Cruz, M. (2015). 3D Tune-In - 3D-games for TUNing and lEarnINg about hearing aids. In *The Hearing Journal*, published online February   2016   - http://journals.lww.com/thehearingjournal/blog/OnlineFirst/pages/post.aspx?PostID=6

3.3: D4 - Dissemination materials

Within this category, the following data has been released:

- Newsletters. The initial 3DTI newsletter email, sent to all the project contacts.
- Press Kit. The two 3DTI press-kits, one for academia and one for general audience.
- Printables. 3DTI project banners and leaflet, and printable material produced by XTeam for their Dartanan app.
- Videos. 3DTI audio demo (3D sound and hearing loss), and 3DTI animation videos, in English, Spanish and Italian.

References

Picinali, L. and Wedekind, G. (2015) Data Management Plan. Public deliverable D7.9 of the European funded H2020 3D Tune-In project (ICT-644051) http://www.3d-tune-in.eu. *October 2015*