

# BNCI Horizon 2020

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**Deliverable:** D5.5  
**Title:** Website infrastructure: Final version of website

Work package: WP5  
Due: M18  
Type:  PU<sup>1</sup>       PP<sup>2</sup>       RE<sup>3</sup>       CO<sup>4</sup>

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Abstract: This deliverable describes the final state of the BNCI Horizon website.  
Keywords: Infrastructure, website

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<sup>1</sup> Public

<sup>2</sup> Restricted to other program participants

<sup>3</sup> Restricted to a group specified by the consortium

<sup>4</sup> Confidential, only for members of the consortium

# 1 Introduction

This deliverable (D5.5) describes the final form of the BNCI Horizon 2020 website *infrastructure* and *content* after eighteen months of the project. This document is based on deliverable D5.1, D5.2, D5.3 and D5.4 which already described the *infrastructure* and *content* of the website up to twelve months.

# 2 Statistics

After installing Google Analytics in October 2014 the website had on April 20, 2015 more than 20,000 page views, see Figure 1 for information from Google Analytics.

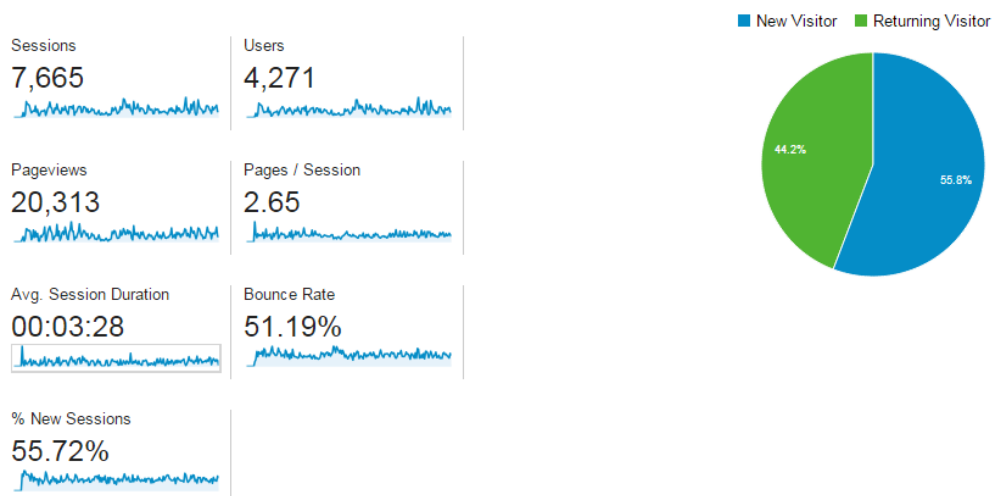


Figure 1: Different statistics of the website.

Moreover demographic information can be found in Figure 2











Country	Sessions	% Sessions
1.  Germany	953	12.43%
2.  Austria	731	9.54%
3.  United States	691	9.02%
4.  Netherlands	580	7.57%
5.  Italy	454	5.92%
6.  South Korea	331	4.32%
7.  Spain	268	3.50%
8.  France	261	3.41%
9.  Switzerland	260	3.39%
10.  Brazil	257	3.35%

Figure 2: Demographic information

# 3 Use of social media

For the dissemination of the project we use Twitter, Facebook, and Google+. All BCI related news, jobs and upcoming events posted on the website are broadcasted through Twitter and Facebook, see 4.1.2. On Twitter we have 82 followers and on Facebook we have 50 likes

Moreover announcements of (draft) versions of the roadmap are disseminated also through Google+ and LinkedIn.

## 4 Website infrastructure and content

The official URL for the website is <http://bnci-horizon-2020.eu/>. Moreover the link [bnci2020.eu](http://bnci2020.eu) is also redirected to the official webpage. The website is hosted by TUG (via an external Austrian provider). The overall design, including a logo, was already established (see D5.4), but additional functionality for social media, such as Facebook and Twitter, was added (see Figure 3, top right corner of the webpage under the logo).



Figure 3: Screenshot of the home page of the website, desktop version.

For the mobile version the layout is a little bit different with a dropdown menu at the left, see Figure 4.

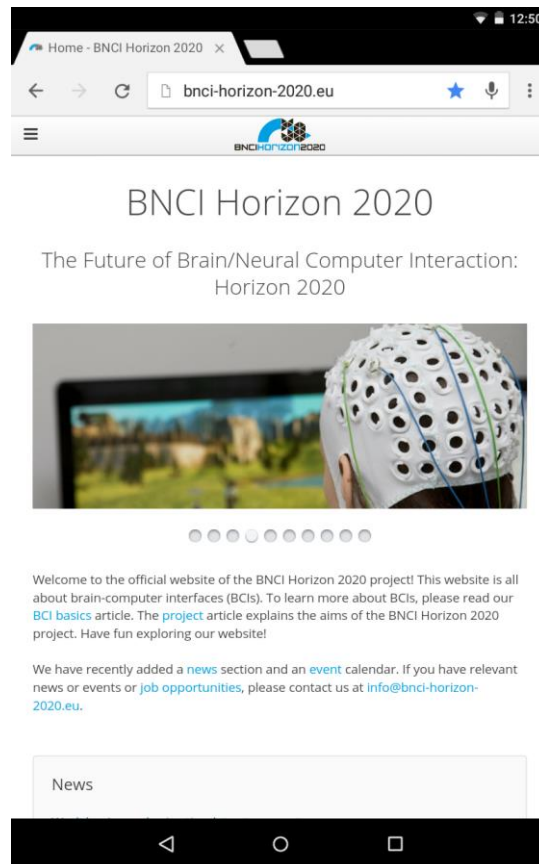


Figure 4: Screenshot homepage mobile version website

The website runs on a standard LAMP (Linux, Apache, MySQL, PHP) environment. We use the content management system (CMS) Joomla!<sup>5</sup> as a basis for our site. On top of Joomla!, the responsive template framework Warp<sup>6</sup> along with a professional template is used.

#### 4.1 Structure of the website

The structure of the website is not changed since the last deliverable D5.4 and can be found in Figure 5.

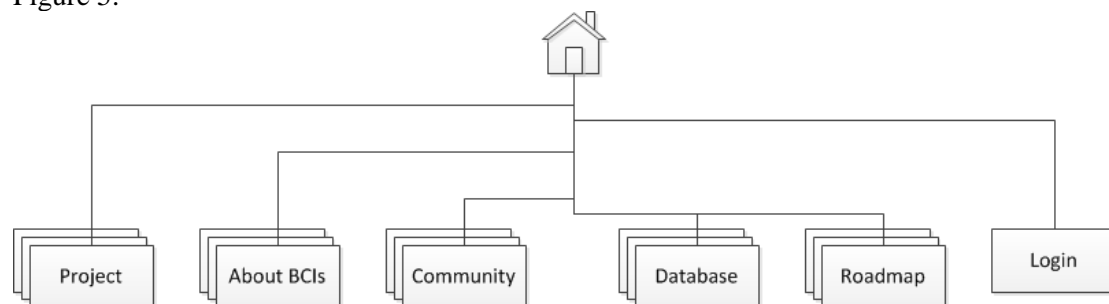


Figure 5: Top structure of the website.

The different subpages are accessible by a (drop-down) menu. A detailed description of the five menu entries is presented in the next subsections.

##### 4.1.1 Project subpage

The *Project* subpage has dropdown menus for *Deliverables*, *Milestones* and *Dissemination*. On the *Deliverables* subpage the list of deliverables can be found, on the *Milestones* subpage the list of milestones. The *Dissemination* subpage is filled with information about

<sup>5</sup> <http://www.joomla.org/>

<sup>6</sup> <http://www.yootheme.com/themes/warp-framework>

dissemination activities. The most prominent dissemination activities of the last few months are:

- Article in the BCI Journal on the project and Hallstat retreat: *BNCI Horizon 2020: towards a roadmap for the BCI community.*(doi: 10.1080/2326263X.2015.1008956) On time of writing this article is in the top five read articles of the journal.
- Presentation about the roadmap at the special session on *Current State of Roadmaps for Clinical Transition of Neural Interfaces in the US, Europe and Japan* in the 2015 Workshop on Clinic Brain-Machine Interface Systems, March 2015, Japan (<http://plaza.umin.ac.jp/cbmi2015/>)

The structure of the *Project* subpage is depicted in Figure 6.

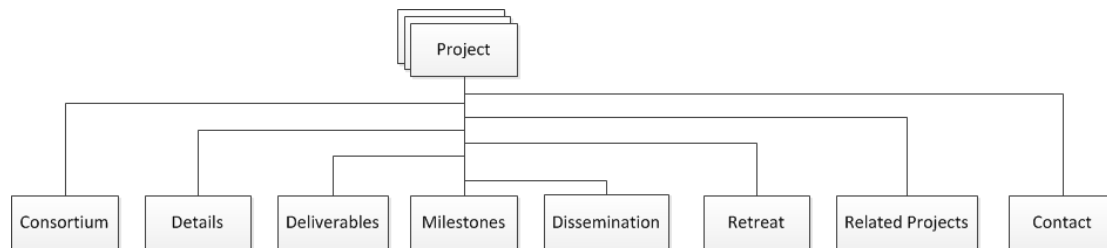


Figure 6: Structure of the Project subpage (drop down menu).

The *Related Projects* has brief descriptions of the BackHome, Brain Bow, Contrast, Mindsee, MoreGrasp (new), NEBIAS, SI-CODE and Way projects. It also contains information about past projects, such as ABC, Future BNCI, the forerunner of this project.

The content for the other subpages are filled with project related information such as deliverables, milestones.

A new subpage of the *About BCIs* part is the *Bibliography* which contains the bibliography of the most influential BCI papers as described in D2.1.

In the other parts visitors can find basic information about BCIs (*Basics*), a glossary of BCI terms (*Glossary*) and links to BCI-related websites. The structure of the *About BCIs* subpage is depicted in Figure 7.

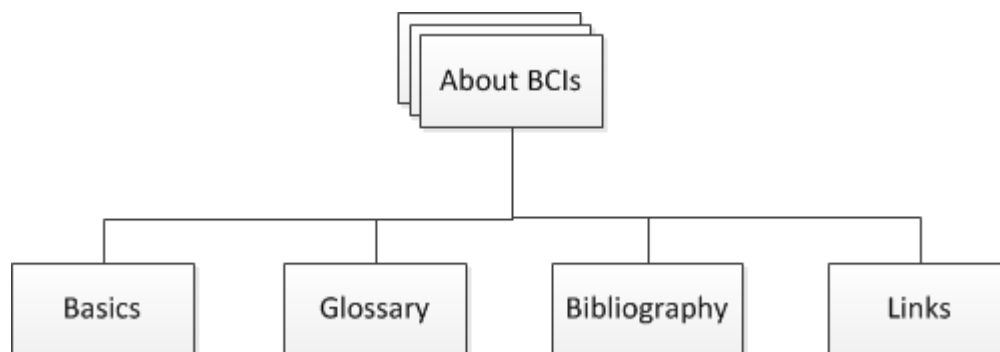


Figure 7: Structure of the About BCIs subpage (drop down menu).

The *Basics* page gives a simple introduction to brain-computer interfaces, and introduces the six scenarios **replace**, **restore**, **enhance**, **supplement**, **improve** and BCI as **research tool** that are used throughout this project and the roadmap.

#### 4.1.2 Community subpage

On the *Community* part of the website, visitors can find news items (*News*). These are news items on BCI in popular science oriented media. This section contains at the moment more than fifty news items.

Relevant BCI related events can be found under *Events*, it contains, at time of writing, eighteen upcoming events and more than fifteen past events.

The *Jobs* subpage contains a list of twenty-three BCI related job positions, including links.

The top news, events and job items are also listed on the home page, see Figure 8. Moreover they are disseminated using Twitter and Facebook, see also Section 3.

News	Jobs	Events
<a href="#">Work begins on brain stimulator to correct memory</a> <a href="#">Tiny brain implants allow blind rats to see</a> <a href="#">Intelligent neuroprostheses mimic natural motor control</a>	<a href="#">PhD position with INRIA Montpellier, France</a> <a href="#">PhD Position: Brain-Computer Interfaces in Cognitive Rehabilitation after Stroke</a> <a href="#">Positions available at Singapore Institute for Neurotechnology</a> <a href="#">Research/software engineer for BrainGate neural interface system</a>	<a href="#">37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS)</a> <a href="#">7th International IEEE EMBS Conference on Neural Engineering</a> <a href="#">44th Annual Meeting of the Society for Neuroscience (SfN)</a>

Figure 8: Top news, events and jobs on home page.

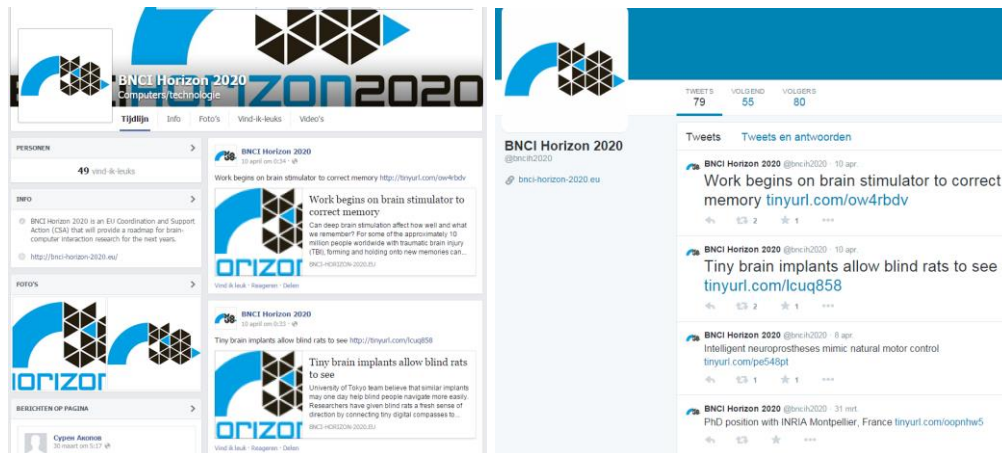


Figure 9: BNCI Horizon 2020 on Facebook (left) and Twitter (right)

The *End Users* page contains information about the MoreGrasp project which focuses on BCI for end users, a short description of the Brain Paint application, including a link . Moreover it contains videos of the end user in the TOBI project and BCI for rehabilitation after stroke.

The *Companies* section lists more than 70 international companies, mostly from Europe (42) and USA (27), which are involved with BCIs with links to their websites.

Information on research groups that are involved in BCI research can be found in the *Research Groups* section of the webpage. At the moment the list is populated with more than 100 research groups around the world, including links to the webpage, see Figure 10. To the best of our knowledge this the largest list of BCI research groups available on the Internet and is still extended.

Analyzing the lists it is clear that there are still some white spots in the list for example no BCI research groups from South America and Africa are listed, but from Figure 2 it follows that the website was visited 257 times by people from Brazil.

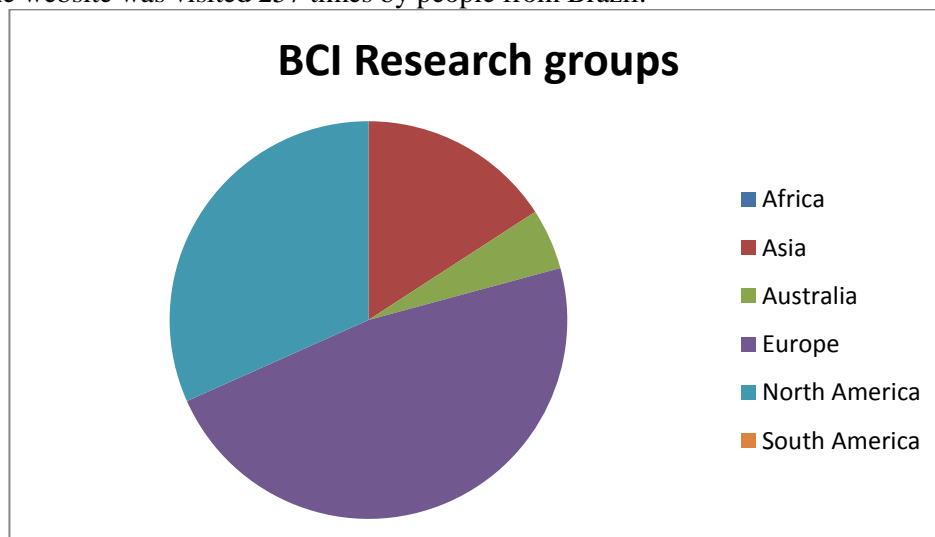


Figure 10: Pie chart for the number of BCI research groups over the continents.

The methodology for extending the list is by looking up affiliations of authors of BCI papers in BCI related journals and conference proceedings. Moreover we set out a call for research groups at the Brain-Computer Interface group of LinkedIn and Google+. The *BCI Society* introduces the group that is founding the BCI Society, and the purpose of this society. The structure of the *Community* subpage is depicted in Figure 11.

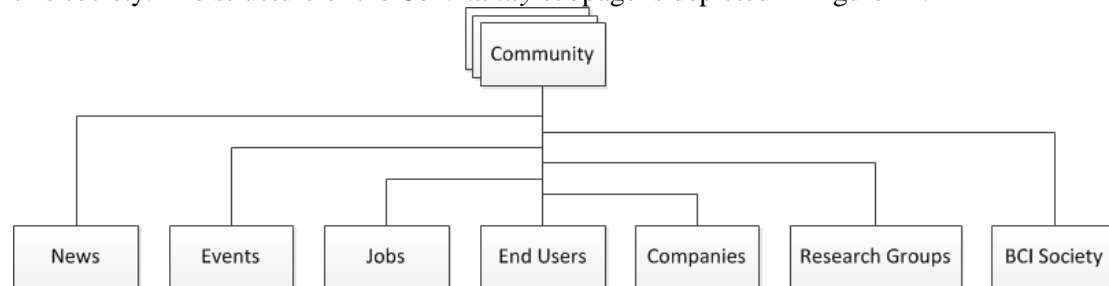


Figure 11: Structure of the BCI Community subpage.

#### 4.1.3 Database subpage

The *Database* section explains the aim, to provide open access BCI datasets, and the requirements to be met for a dataset to be listed on the website. See Figure 12 for an impression of the Database section.

[Home](#) / [Database](#) / [Data sets](#)

## Data sets

All data sets in this database are open access. This means that you can freely download and use the data according to their licenses. Additionally, if there is an associated publication, please make sure to cite it.

### Four class motor imagery (001-2014)

This four class motor imagery data set was originally released as data set 2a of the [BCI Competition IV](#).

Participants	9
Signals	22 EEG, 3 EOG
Data	<a href="#">A01T, A01E, A02T, A02E, A03T, A03E, A04T, A04E, A05T, A05E, A06T, A06E, A07T, A07E, A08T, A08E, A09T, A09E</a>
License	<a href="#">Creative Commons Attribution No Derivatives license (CC BY-ND 4.0)</a>
Licensor	<a href="#">Institute for Knowledge Discovery, Graz University of Technology</a>
Description	<a href="#">PDF (will be updated and extended soon)</a>
Publication	<a href="#">DOI</a>
Contact	<a href="#">Clemens Brunner</a>

Figure 12: Impression of Database section.

Currently the database contains twelve datasets, all following the description depicted in Figure 12:

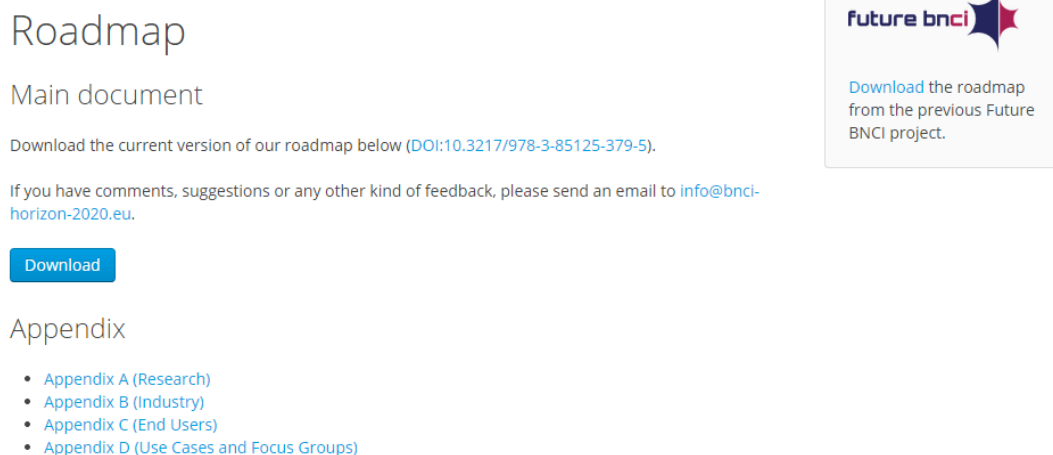
1. Four class motor imagery (001-2014). This four class motor imagery data set was originally released as data set 2a of the [BCI Competition IV](#). Licensor: Institute for Knowledge Discovery, Graz University of Technology
2. Two class motor imagery (002-2014)  
Licensor: Institute for Knowledge Discovery, Graz University of Technology
3. Mental arithmetic (003-2014)  
Licensor: Institute for Knowledge Discovery, Graz University of Technology
4. Two class motor imagery (004-2014) This two class motor imagery data set was originally released as data set 2b of the [BCI Competition IV](#).  
Licensor: Institute for Knowledge Discovery, Graz University of Technology
5. Auditory oddball during hypnosis (005-2014)  
Licensor: Prof. Dr. Andrea Kübler, Department of Psychology I, Institute for Psychology, University of Würzburg

6. SCP training in stroke (006-2014)  
Licensor: Prof. Dr. Andrea Kübler, Department of Psychology I, Institute for Psychology, University of Würzburg
7. Two-finger gameplay with deliberately failing controller (007-2014)  
Licensor: Human Media Interaction, University of Twente
8. P300 speller with ALS patients (008-2014)  
Licensor: Neuroelectrical Imaging and BCI Laboratory, IRCCS Fondazione Santa Lucia, Rome, Italy
9. Covert and overt ERP-based BCI (009-2014)  
Licensor: Neuroelectrical Imaging and BCI Laboratory, IRCCS Fondazione Santa Lucia, Rome, Italy
10. Autocalibration and recurrent adaptation (001-2015)  
Licensor: Institute for Knowledge Discovery, Graz University of Technology.
11. Neuroprosthetic control of an EEG/EOG BNCI (002-2015)  
Licensor: Applied Neurotechnology Lab, Institute of Medical Psychology and Behavioral Neurobiology and Department of Psychiatry and Psychotherapy, University Hospital of Tübingen, Germany
12. Visual P300 speller (003-2015)  
Licensor: g.tec medical engineering

For BCI datasets not meeting the requirements here is only a link to the repository containing the dataset. At the moment there are links to tree BCI competition datasets and one BCI 2000 dataset. At the time of writing there were 693 downloads of part of the datasets.

#### 4.1.4 Roadmap subpage

At the *Roadmap* subpage visitors can download the current version of the roadmap and the appendices A until D on which the roadmap is based, see Figure 13 .



The screenshot shows the 'Roadmap' section of the BNCI website. It features a main document download link with a DOI (10.3217/978-3-85125-379-5), a 'Download' button, and a list of appendices: Appendix A (Research), Appendix B (Industry), Appendix C (End Users), and Appendix D (Use Cases and Focus Groups). A 'future bnci' logo is visible in the top right corner of the page, along with a link to download the previous Future BNCI project roadmap.

Figure 13: The Roadmap section.

At the time of writing the draft roadmap was downloaded 713 times.

#### 4.1.5 Login

On the *Login* subpage members of the community can log in and add or download nonpublic information about the project, such as certain deliverables.