

BNCI Horizon 2020

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Title: BCI database

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Abstract: This deliverable describes the requirements for our BCI database.
Keywords: BCI database, requirements

¹ Public

² Restricted to other program participants

³ Restricted to a group specified by the consortium

⁴ Confidential, only for members of the consortium

1 Aim

The aim of the database website on the BNCI Horizon 2020 webpage is to provide open access BCI data sets to the general public. We believe that such a collection of different data sets will increase scientific transparency and efficiency, promote the validation of published methods, and foster the development of new algorithms. In addition, publishing research data is becoming more important as public funding agencies are moving towards open research data requirements. For example, the European Commission has recently launched a pilot to open up publicly funded research data [1]. All projects participating in this pilot are required to maintain a data management plan, which describes the specific measures to make data generated in the project publicly available.

2 Requirements

2.1 Anonymization

Publishing data collected from and about people (which includes BCI data) requires a few extra precautions that need to be taken into account. For starters, the privacy of all participants must be protected. This means that it must be impossible to trace the data back to an individual person (or sometimes even to a group of individuals). Therefore, such personal information must be anonymized before the corresponding data can be publicly released.

The Health Insurance Portability and Accountability Act (HIPAA) provides detailed guidelines on how to anonymize personal information. In particular, the following identifiers must be removed [2]:

1. Names
2. Geographic subdivision smaller than a state
3. Dates except year (people above age 89 must be aggregated into a category of age 90 or older)
4. Telephone numbers
5. Fax numbers
6. E-mail addresses
7. Social security numbers
8. Medical record numbers
9. Health plan beneficiaries numbers
10. Account numbers
11. Certificate/license numbers
12. Vehicle identifiers and serial numbers (e.g. license plate numbers)
13. Device identifiers and serial numbers
14. URLs
15. IP address numbers
16. Biometric identifiers (e.g. finger prints)
17. Full face photographic and comparable images
18. Any other unique identifying number, characteristic or code

We think that this recommendation is reasonable and should be followed when removing personal information in BCI data sets.

2.2 Informed consent

It is important to obtain informed consent from each participant before publishing the (anonymized) data. Although both verbal and written consent are equally valid, we strongly recommend the written alternative. The consent form should contain an explicit provision for data sharing, and participants should be informed how their data will be used, stored, and shared. The UK Data Archive website provides a good sample consent form [3], which is usually distributed together with an information sheet.

2.3 Ethics committee approval

Research standards often require studies to be approved by ethics committees. These bodies are referred to as Research Ethics Committee (REC), Independent Ethics Committee (IEC), Ethical Review Board (ERB) or Institutional Review Board (IRB). Regulations differ from country to country, and approval by an ethics committee might not always be required by law. However, we recommend to obtain ethics clearance for all BCI studies involving collection of new data. If possible, a large and official ethics committee should be preferred over small internal committees, for example committees registered with the Office for Human Research Protections (OHRP) [4] at the US Department of Health and Human Services (DHHS) [5].

2.4 Licensing

Before sharing the data, the contributors need to make sure that they own the copyrights of the data sets. Since our database contains open data, the data should be licensed with an appropriate license. We strongly suggest to use one of the existing licenses for this purpose, for example the Creative Commons Attribution License [6] or the Open Data Commons Attribution License [7]. Both of these licenses let others use your data freely as long as they appropriately credit the contributors for the original data. A good default option is the Creative Commons Attribution No Derivatives license (CC BY-ND 4.0) [8].

3 Submission of data sets

To add a data set to our database, the following questions need to be addressed:

1. Does the data meet the requirements described above (anonymization, informed consent, ethics approval)? Anonymization is mandatory. Information on the availability of informed consent and ethics approval must be declared (and will be displayed in the description of the data set on the website).
2. Who owns the copyright of the data? Is the data set freely available, or are there any restrictions pertaining to the sharing of the data? Is the data licensed under one of the commonly used open licenses for data, as offered for instance by Creative Commons [6] or Open Data Commons [7]?
3. Does the data come with a detailed description on the experimental paradigm, recording setup, and other relevant metadata?
4. Is the data in a format that can be readily accessed with standard tools (we strongly prefer open data formats)?

We will provide examples on how to properly attribute the data set and the BNCI Horizon 2020 database directly on our website (this might include a link to a reference publication about the specific data set in a scientific journal).

4 BNCI Horizon Website

The information presented above is already available on our database website [9]. It will be continuously updated to reflect progress in our ongoing discussions.

5 Data sets (examples)

This section demonstrates how data sets could be presented on our database website. Please note that these are only examples and not actual entries that will be published on our website. Before we can include any data set, we need to obtain copyright clearance and proper licencing of the data.

5.1 BCI Competition III, data set I

Title	Motor imagery in ECoG recordings
Short description	-
Contributor	Departments of Computer Engineering and Medical Psychology and Behavioral Neurobiology, Eberhard-Karls-Universität Tübingen, Germany; Max-Planck-Institute for Biological Cybernetics, Tübingen, Germany; Department of Epileptology, Universität Bonn, Germany
Contact	Niels Birbaumer, Bernhard Schölkopf
License	CC BY-ND 4.0
Informed consent	Yes
Ethics approval	Yes
Description	PDF
Download	ZIP

5.2 BCI Competition IV, data set 2a

Title	4-class motor imagery
Short description	-
Contributor	Institute for Knowledge Discovery, Graz University of Technology, Graz, Austria
Contact	Clemens Brunner, Robert Leeb, Gernot Müller-Putz, Alois Schlögl, Gert Pfurtscheller
License	CC BY-ND 4.0
Informed consent	Yes
Ethics approval	No
Description	PDF
Download	ZIP

5.3 BCI Competition IV, data set 4

Title	Finger movements in ECoG
Short description	-
Contributor	Departments of Physics and Medicine of the University of Washington, Seattle, WA, USA; Wadsworth Center, New York State Department of Health, Albany, NY, USA
Contact	Kai J. Miller, Gerwin Schalk

License	ODC-BY 1.0
Informed consent	Yes
Ethics approval	Yes
Description	PDF
Download	ZIP

6 Sample consent form

Please tick the appropriate boxes Yes No

Participation

I have read and understood the study information sheet.

I have been given the opportunity to ask questions about the study.

I agree to take part in the study.

I understand that my taking part is voluntary and that I can withdraw from the study at any time without giving any reasons for why I no longer want to participate.

Use of the information I provide for this study

I understand that my personal information such as my name, phone number or email address will not be revealed to people outside this study.

I understand that my data may be used in publications, reports, web pages, and other research outputs in anonymized form.

Use of the information I provide beyond this study

I agree that the data I provide in this study may be publicly shared in anonymized form.

Transfer of copyright

I agree to assign the copyright I hold in any materials related to this study to the Institute of Knowledge Discovery, Graz University of Technology, Graz, Austria.

Name of participant (printed) Signature Date

Name of researcher (printed) Signature Date

7 References

- [1] http://europa.eu/rapid/press-release_IP-13-1257_en.htm
- [2] <http://med.stanford.edu/irt/security/hipaa.html>
- [3] <http://www.data-archive.ac.uk/media/112638/ukdamodelconsent.pdf>
- [4] <http://www.hhs.gov/ohrp/>
- [5] <http://www.hhs.gov/>
- [6] <http://creativecommons.org/>
- [7] <http://opendatacommons.org/>
- [8] <http://creativecommons.org/licenses/by-nd/4.0/>
- [9] <http://bnci-horizon-2020.eu/index.php/about/database>