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BIDS How-to for a person converting old Bruker or Agilent dataset to BIDS format

Conversion from magnet formats to BIDS is normally easy. While using commonly used imaging sequences, the data only must have unique identifiers for subject and session. As for existing data, where the researcher has not been thinking about potential formatting issues: studies with a single dataset per subject are usually fine. In repeated measures studies, it is quite common that subject or session naming is not fully consistent.

The conversion tool for Bruker data is brkraw (). The tool works on Python 3.6. Brkraw process has three phases: 1) collection of relevant information and representation of the information in XLSX spreadsheet, 2) checking and correcting the information in the XLSX sheet by the researcher, 3) conversion of data from Bruker format to rawdata folder in NIfTI-BIDS format.

Bruker tool changes hyphens in the subject and session naming to 'Hyphen' and underscores to 'Underscore'. This must be corrected in the XSLX file. We have chosen to change hyphens to 'x' as our convention. In order to keep the list in alphabetic order, we usually add leading zeroes (0s) to the subject and week numbers. Therefore, original subject name, such as JPa-7-2w becomes sub-JPax007x02w.

The most convenient way of ensuring consistent naming and data locations is to perform the required (step 2) XLSX changes via script. That way hyphens and underscores are always correctly converted. The same applies to potential subject or session naming changes, as this leaves a digital trace of the changes.

We also have some experimental (still somewhat limited) script packages that convert Agilent formats to BIDS structure.

An example Snakemake script that performs conversion from Bruker data to BIDS structure. The command to use: `> snakemake --cores 1 create_rawdata`

```
# conversion from sourcedata to rawdata - do this
separately
rule all:
    input:
        "../rawdata"


###
### construct rawdata from sourcedata
###

# the first brkraw round -> XLS & JSON files describing
the data
rule brkraw_preprocess:
    input:
        "../sourcedata"
    output:
        xls="project_data.xlsx",
        json="project_data.json"
            params:
```

```
        pre="project_data"
    shell:
        "brkraw bids_helper {input} {params.pre} -j; "

# python-modifications to Excel file
rule modify_xlsx:
    input:
        "project_data.xlsx"
    output:
        "project_data_mod.xlsx"
    shell:
        "python3.9 modify_excel_file.py {input} {output}"

# the second brkraw round -> source data -> rawdata
structure using modified Excel data
rule create_rawdata:
    input:
        src_data="../sourcedata",
        mod_xls="project_data_mod.xlsx",
        json="project_data.json"
    output:
        directory("../rawdata")
    shell:
        "brkraw bids_convert {input.src_data}
{input.mod_xls} -j {input.json} -o {output}"
```

An example script for modifying the first round XLSX file:

```
import pandas as pd
import os
import sys
import openpyxl
from openpyxl.utils.dataframe import dataframe_to_rows


def modify_excel_file(filename, new_filename):
    fparts = os.path.splitext(filename)
    fn = fparts[-2]
    fe = fparts[-1]

    # read the brkraw-produced excel file
    wb = openpyxl.load_workbook(fn+fe)
    ws = wb.active
    df = pd.DataFrame(ws.values)

    # write modifications here
    df = df.replace({'Hyphen': 'x'}, regex=True)

    wbn = openpyxl.Workbook()
    wsn = wbn.active
    for r in dataframe_to_rows(df, index=False,
            header=False):
```

```
        wsn.append(r)

    for cell in wsn[1]:
        cell.style = 'Pandas'

    # save modified XLS file
    wbn.save(new_filename)


# collect snakemake file names
xls_file_in = str(sys.argv[1])
xls_file_out = str(sys.argv[2])

modify_excel_file(xls_file_in, xls_file_out)
```

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