

Fig 1. Schematic of NiChart software suite

| Study        | Clinical Emphasis |    |     |    |    |    |      | Years MRI<br>1995-2020 | Age<br>20-100<br>years | PT           | Counts       |              |              | FU<br>0-20<br>years | Racial Diversity |             |            |           |
|--------------|-------------------|----|-----|----|----|----|------|------------------------|------------------------|--------------|--------------|--------------|--------------|---------------------|------------------|-------------|------------|-----------|
|              | Ag                | AD | CVD | Di | PH | RS | OTHR |                        |                        |              | sMRI         | fMRI         | dMRI         |                     | Asian            | African     | MultiOther | NativeAm  |
| ABIDE**      |                   |    |     |    |    |    |      |                        |                        | 1257         | 1490         | 1490         | 0            |                     | TBD              | TBD         | TBD        | TBD       |
| ACCORD*      |                   |    |     |    |    |    |      |                        |                        | 629          | 1414         | 0            | TBD          |                     | 0                | 67          | 0          | 0         |
| ADNI*        |                   |    |     |    |    |    |      |                        |                        | 2515         | 10853        | 4267         | 2959         |                     | 39               | 105         | 20         | 4         |
| AIBL         |                   |    |     |    |    |    |      |                        |                        | 1264         | 1978         | 0            | 0            |                     | 0                | 0           | 0          | 0         |
| ANMerge*     |                   |    |     |    |    |    |      |                        |                        | 453          | ~1350        | 0            | 0            |                     | 0                | 0           | 0          | 0         |
| BIOCARD      |                   |    |     |    |    |    |      |                        |                        | 319          | 1152         | 0            | 0            |                     | 3                | 4           | 1          | 0         |
| BLSA         |                   |    |     |    |    |    |      |                        |                        | 1174         | 3928         | 2233         | 164          |                     | 55               | 239         | 17         | 4         |
| CARDIA*      |                   |    |     |    |    |    |      |                        |                        | 894          | 1379         | 1636         | 1658         |                     | 0                | 372         | 0          | 0         |
| CoorMD**     |                   |    |     |    |    |    |      |                        |                        | 2858         | 3001         | 3001         | 0            |                     | TBD              | TBD         | TBD        | TBD       |
| EDIC*        |                   |    |     |    |    |    |      |                        |                        | 490          | 490          | 460          | 490          |                     | TBD              | TBD         | TBD        | TBD       |
| HANDLS       |                   |    |     |    |    |    |      |                        |                        | 263          | 263          | 0            | 263          |                     | 0                | 63+         | 0          | 0         |
| HCP*         |                   |    |     |    |    |    |      |                        |                        | 1200         | 1200         | 1200         | 1200         |                     | TBD              | TBD         | TBD        | TBD       |
| LookAhead*   |                   |    |     |    |    |    |      |                        |                        | 320          | 320          | 0            | 320          |                     | 0                | 70          | 0          | 0         |
| MESA*        |                   |    |     |    |    |    |      |                        |                        | 1063         | 1063         | 1062         | 1062         |                     | 158              | 267         | 0          | 0         |
| OASIS        |                   |    |     |    |    |    |      |                        |                        | 1094         | 2154         | 3621         | 2450         |                     | 5                | 165         | 0          | 0         |
| PENN         |                   |    |     |    |    |    |      |                        |                        | 1314         | 1549         | 320          | TBD          |                     | 20               | 203         | 34         | 0         |
| PHENOM**     |                   |    |     |    |    |    |      |                        |                        | 2277         | 2288         | 0            | 0            |                     | TBD              | TBD         | TBD        | TBD       |
| SHIP*        |                   |    |     |    |    |    |      |                        |                        | 3311         | 3311         | 0            | 0            |                     | 0                | 0           | 0          | 0         |
| SPRINT*      |                   |    |     |    |    |    |      |                        |                        | 788          | 1336         | ~1330        | ~1330        |                     | 7                | 241         | 9          | 0         |
| UKBIOBANK*   |                   |    |     |    |    |    |      |                        |                        | 40580        | 40991        | ~37000       | ~37000       |                     | 594              | 256         | 383        | 0         |
| WHIMS*       |                   |    |     |    |    |    |      |                        |                        | 1305         | 1966         | 0            | 0            |                     | 23               | 57          | 0          | 4         |
| WRAP         |                   |    |     |    |    |    |      |                        |                        | 325          | 735          | 0            | 0            |                     | 2                | 6           | 11         | 3         |
| <b>Total</b> |                   |    |     |    |    |    |      |                        |                        | <b>65693</b> | <b>84211</b> | <b>57620</b> | <b>48896</b> |                     | <b>906</b>       | <b>2115</b> | <b>475</b> | <b>15</b> |

Ag: aging; AD: Alzheimer's disease; CVD: cardio-vascular disease; Di: Diabetes; PH: psychosis/mental health; RS: race/socio-economics; OTHR: other; PT: number of participants; FU: MRI Follow-Up; \*: multi-site; \*\*: multi-study

Fig 2. Reference MRI dataset used for data harmonization and for training machine learning (ML) models

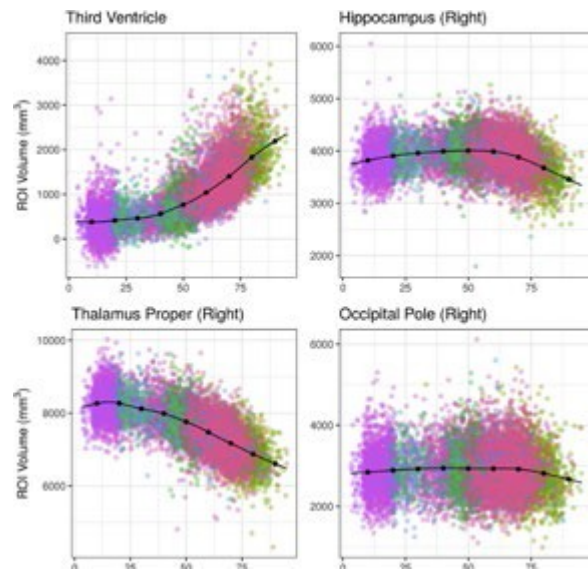


Fig 3. Age trends of selected imaging features after data harmonization

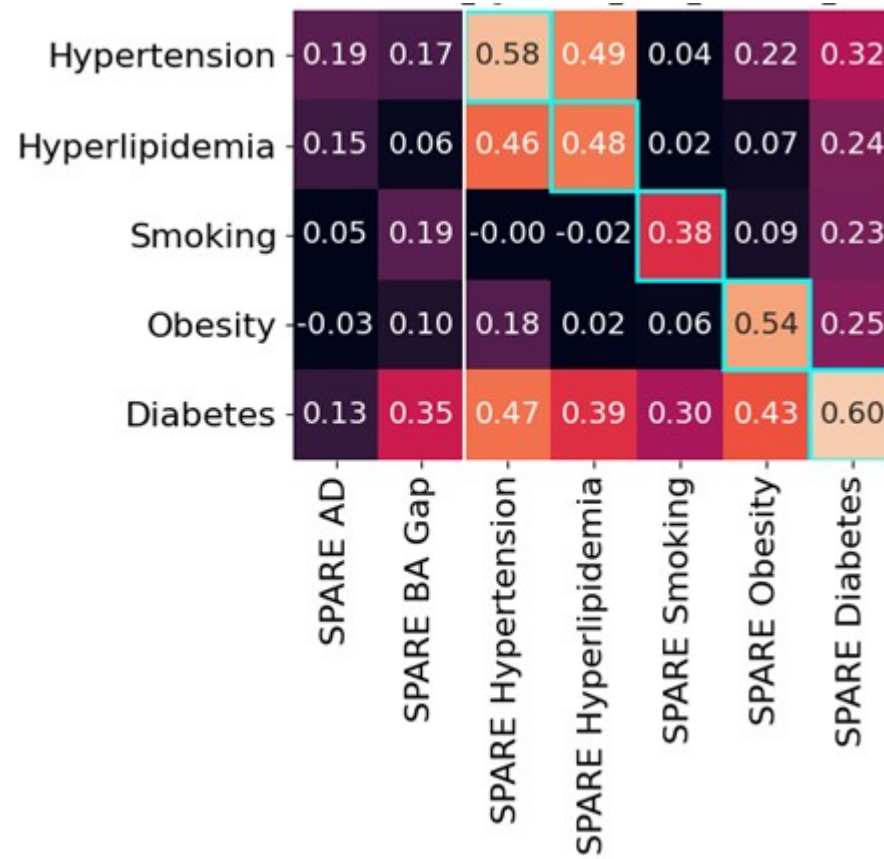


Fig 4. Panel of SPARE scores derived from the reference dataset. Correlations between SPARE scores for various diseases and conditions

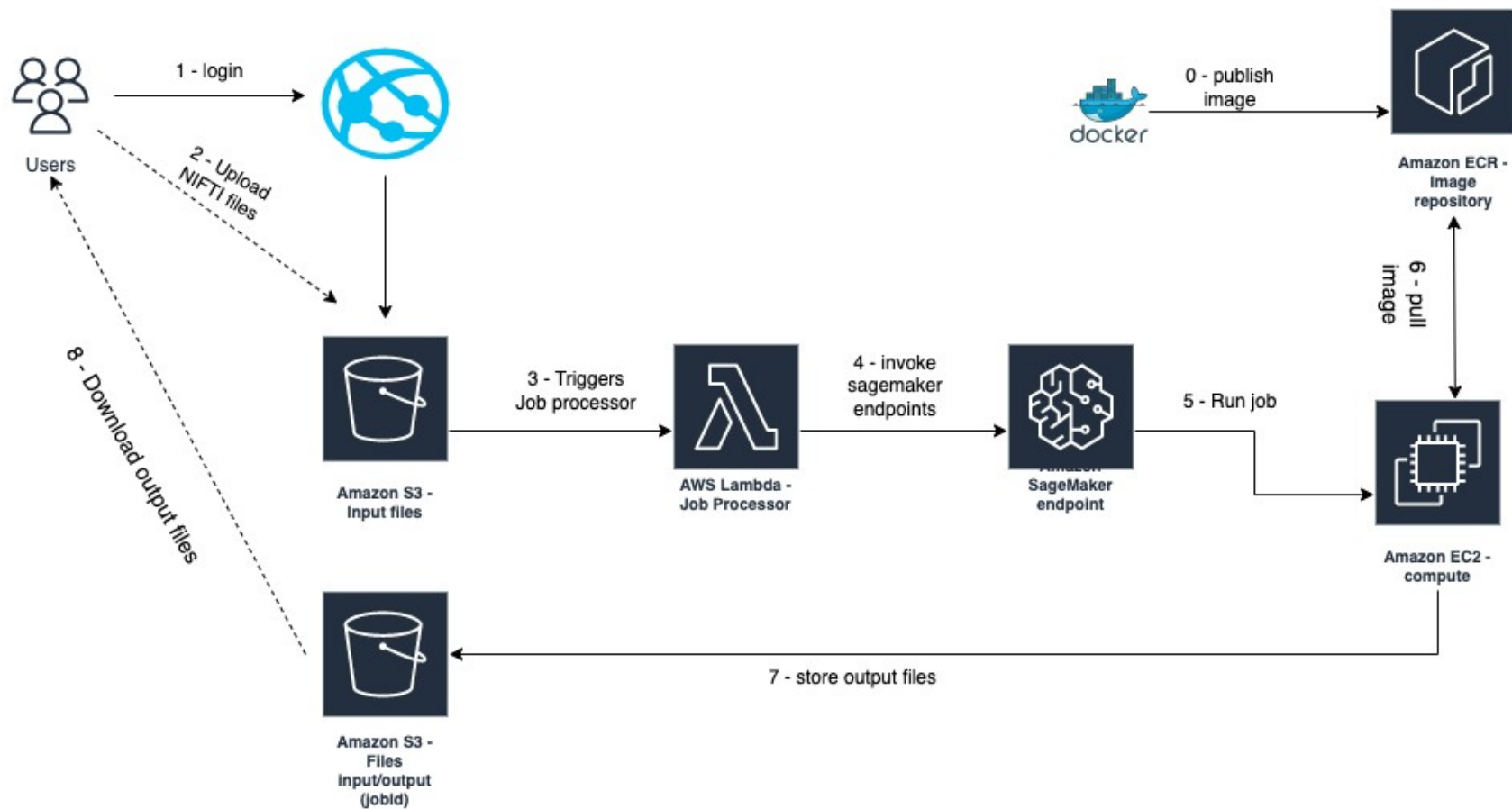


Fig 5. Architecture diagram of the web interface