**Supplementary materials**

**Supplementary file 1: The inclusion and exclusion criteria**

Individuals with the following characteristics were included: (1) those aged 40–65 years; (2) those with a first-ever unilateral ischemic or hemorrhagic stroke; (3) those with a period after stroke of <6 months; (4) those who had undergone ≥12 RAGT sessions; (5) those who had been informed of the purpose of the study and the anonymity and confidentiality of the study participants, agreed to participate in the test, and signed the consent form; and (6) those judged to understand and cooperate with the contents of the clinical study and be able to participate by the end of the clinical study. The exclusion criteria were (1) severe cognitive impairment of not more than 10 points for MMSE score; (5) orthopedic problems having difficulty walking with lower extremity fractures or osteoarthritis; (6) instability angina; (7) neurological surgery or epilepsy; (8) other clinical studies related to rehabilitation therapy aimed at improving motor function within 30 days before the start of this study; (9) weight >100 kg and height <150 cm; (10) pregnant individuals; and (11) those judged to be inappropriate by the person in charge to be included in the study.

**Supplementary file 2: The feature importance of the five-machine learning (ML) model in minimal clinical importance difference (a) and effect level (b).**

**Table 1-(a) The feature importance of the five-machine learning (ML) model in minimal clinical importance difference (MCID)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable|ML** | **DT** | **RF** | **XGB** |  **LGB** | **CAT** | **Average** |
| Final BBS | 0.4358 | 0.1948 | 0.2077 | 0.1922 | 0.2628 | 0.2586 |
| FinalMBI | 0.0559 | 0.0978 | 0.0814 | 0.0953 | 0.0884 | 0.0838 |
| InitialBBS | 0.0605 | 0.0544 | 0.0701 | 0.1109 | 0.0752 | 0.0742 |
| FinalFMA | 0.1391 | 0.0512 | 0.0456 | 0.0781 | 0.0416 | 0.0711 |
| InitialMBI | 0.0566 | 0.0631 | 0.0486 | 0.0906 | 0.0379 | 0.0594 |
| FinalTIS | 0.0669 | 0.0920 | 0.0721 | 0.0281 | 0.0360 | 0.0590 |
| FinalMAS | 0.0711 | 0.0282 | 0.0693 | 0.0297 | 0.0433 | 0.0483 |
| Age | 0.0000 | 0.0533 | 0.0466 | 0.0797 | 0.0559 | 0.0471 |
| weight | 0.0410 | 0.0487 | 0.0265 | 0.0453 | 0.0521 | 0.0427 |
| FinalMMSE | 0.0364 | 0.0626 | 0.0400 | 0.0297 | 0.0381 | 0.0414 |
| Height | 0.0190 | 0.0401 | 0.0547 | 0.0344 | 0.0406 | 0.0378 |
| InitialTIS | 0.0177 | 0.0414 | 0.0415 | 0.0281 | 0.0382 | 0.0334 |
| InitialFMA | 0.0000 | 0.0431 | 0.0253 | 0.0578 | 0.0301 | 0.0313 |
| InitialMMSE | 0.0000 | 0.0358 | 0.0411 | 0.0375 | 0.0418 | 0.0312 |
| InitialMAS | 0.0000 | 0.0257 | 0.0336 | 0.0219 | 0.0438 | 0.0250 |
| Onset time | 0.0000 | 0.0261 | 0.0548 | 0.0109 | 0.0236 | 0.0231 |
| Diagnosis | 0.0000 | 0.0066 | 0.0214 | 0.0078 | 0.0099 | 0.0091 |
| Sid of lesion | 0.0000 | 0.0083 | 0.0125 | 0.0047 | 0.0088 | 0.0069 |
| Sex | 0.0000 | 0.0065 | 0.0072 | 0.0031 | 0.0078 | 0.0049 |

**Table 1-(b) The feature importance of the five-machine learning (ML) model in effect level**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable|ML** | **DT** | **RF** | **XGB** |  **LGB** | **CAT** | **Average** |
| FinalBBS | 0.2244 | 0.1246 | 0.1434 | 0.1261 | 0.1722 | 0.1582 |
| Age | 0.1094 | 0.0744 | 0.0795 | 0.0900 | 0.1009 | 0.0908 |
| FinalMBI | 0.0882 | 0.0842 | 0.0473 | 0.0801 | 0.0656 | 0.0731 |
| InitialBBS | 0.0559 | 0.0575 | 0.0646 | 0.0882 | 0.0498 | 0.0632 |
| FinalFMA | 0.0653 | 0.0582 | 0.0465 | 0.0666 | 0.0661 | 0.0605 |
| FinalMMSE | 0.0556 | 0.0698 | 0.0527 | 0.0485 | 0.0557 | 0.0564 |
| InitialMBI | 0.0273 | 0.0601 | 0.0568 | 0.0886 | 0.0459 | 0.0557 |
| weight | 0.0754 | 0.0492 | 0.0256 | 0.0574 | 0.0579 | 0.0531 |
| height | 0.0781 | 0.0526 | 0.0387 | 0.0400 | 0.0484 | 0.0516 |
| InitialMMSE | 0.0562 | 0.0481 | 0.0524 | 0.0517 | 0.0432 | 0.0503 |
| InitialFMA | 0.0464 | 0.0531 | 0.0428 | 0.0680 | 0.0351 | 0.0491 |
| onset time | 0.0334 | 0.0396 | 0.0610 | 0.0340 | 0.0704 | 0.0477 |
| FinalTIS | 0.0000 | 0.0700 | 0.0417 | 0.0499 | 0.0441 | 0.0412 |
| InitialMAS | 0.0311 | 0.0259 | 0.0724 | 0.0252 | 0.0334 | 0.0376 |
| InitialTIS | 0.0292 | 0.0463 | 0.0419 | 0.0354 | 0.0275 | 0.0361 |
| FinalMAS | 0.0076 | 0.0273 | 0.0348 | 0.0174 | 0.0353 | 0.0245 |
| Side of lesion | 0.0029 | 0.0105 | 0.0513 | 0.0078 | 0.0129 | 0.0171 |
| Diagnosis | 0.0000 | 0.0094 | 0.0224 | 0.0145 | 0.0097 | 0.0112 |
| Sex | 0.0000 | 0.0091 | 0.0242 | 0.0007 | 0.0035 | 0.0075 |

**Supplementary file 3: Partial dependency plot (PDP) of random forest algorithm on MCID**



**Supplementary file 4:** **Partial dependency plot (PDP) of categorical boosting (CAT) on MCID**



**Supplementary file 5:** **Partial dependency plot (PDP) of light gradient boosting (LGB) on MCID**



**Supplementary file 6:** **Partial dependency plot (PDP) of decision tree on MCID**



**Supplementary file 7: Partial dependency plot (PDP) of eXtreme Gradient Boosting on four effect level (multiclassification)**

