TABLE I  
The results of classification in cross-validated model.

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| **Model** | | **Factorization method** | **Embedding method** | **Classification  Accuracy 2 (%)** |
| **Random Forest** | **Clinical** | | - | 73.6 (±9.5) |
| **NMF** | | Gaussian | 77.6 (±4.9) |
| **NMF**  **NMF +Clinical**  **NMF +Clinical** | | Bell  Gaussian  Bell | 78.2 (±3.4)  76.9 (±5.4)  79.6 (±4.9) |
| **Deep SemiNMF** | | Gaussian | 78.9 (±5.6) |
| **Deep SemiNMF** | | Bell | 83.0 (±4.3) |
| **Deep SemiNMF +Clinical** | | Gaussian | 79.6 (±4.9) |
| **Deep SemiNMF +Clinical** | | Bell | 80.3 (±3.9) |
| **Logistic Regression** | **NMF** | | Gaussian | 79.6 (±2.1) |
| **NMF**  **NMF +Clinical**  **NMF +Clinical** | | Bell  Gaussian  Bell | 80.3 (±4.7)  79.6 (±5.5)  81.6 (±3.9) |
| **Deep SemiNMF** | | Gaussian | 81.0 (±5.7) |
| **Deep SemiNMF** | | Bell | 83.0 (±8) |
| **Deep SemiNMF+Clinical** | | Gaussian | 80.3 (±4.7) |
| **Deep SemiNMF +Clinical** | | Bell | 81.6 (±3.9) |

1 The covariates used for the clinical and demographics were race, age, and marital status. 2 Classification accuracy reported by mean (±STD) (Standard deviation-STD).