

|                                   | Technique                           | References                         | Memorywise-Effortless | Scalable-for-Users | Nothing-to-Carry | Physically-Effortless | Easy-to-Learn | Efficient-to-Use | Infrequent-Errors | Easy-Recovery-from-Loss | Accessible | Negligible-Cost-per-User | Server-Compatible | Platform-Independence | Mature | Non-Proprietary | Resilient-to-Physical-Observation | Resilient-to-Targeted-Impersonation | Resilient-to-Throttled-Guessing | Resilient-to-Unthrottled-Guessing | Resilient-to-Internal-Observation | Resilient-to-Leaks-from-Other-Verifiers | Resilient-to-Phishing | Resilient-to-Theft | No-Trusted-Third-Party | Requiring-Explicit-Consent | Unlinkable |
|-----------------------------------|-------------------------------------|------------------------------------|-----------------------|--------------------|------------------|-----------------------|---------------|------------------|-------------------|-------------------------|------------|--------------------------|-------------------|-----------------------|--------|-----------------|-----------------------------------|-------------------------------------|---------------------------------|-----------------------------------|-----------------------------------|---|-----------------------|--------------------|------------------------|----------------------------|------------|
| Secret                            | Pin/password                        |                                    | ●                     | ●                  | ●                | ○                     | ●             | ●                | ●                 | ●                       | ●          | ●                        | ●                 | ●                     | ●      | ○               | ●                                 | ●                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ●                      |                            |            |
| Secret                            | Pseudo Pressure                     | [25]                               | ●                     | ●                  | ●                | ○                     | ●             | ●                | ●                 | ●                       | ●          | ●                        | ●                 | ●                     | ●      | ●               | ○                                 | ●                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ●                      |                            |            |
| Graphical based Password          | Recall based technique              | [26],[27],[28],[29],[30],[31],[32] | ●                     | ●                  | ●                | ○                     | ○             | ○                | ●                 | ●                       | ●          | ●                        | ●                 | ●                     | ●      | ●               | ●                                 | ●                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ●                      |                            |            |
| Graphical based Password          | Recognition based technique         | [33],[34],[35]                     | ●                     | ●                  | ●                | ○                     | ○             | ○                | ●                 | ●                       | ●          | ●                        | ●                 | ●                     | ●      | ●               | ●                                 | ●                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ●                      |                            |            |
| Physical Biometric                | Finger Print                        | [7][8]                             | ●                     | ●                  | ●                | ●                     | ●             | ●                | ○                 | ○                       | ●          | ●                        | ●                 | ●                     | ●      | ●               | ●                                 | ●                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ○                      |                            |            |
| Physical Biometric                | Iris Recognition                    | [36]                               | ●                     | ●                  | ●                | ●                     | ●             | ●                | ●                 | ●                       | ●          | ●                        | ●                 | ●                     | ●      | ●               | ○                                 | ●                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ○                      |                            |            |
| Physical Biometric                | Voice recognition                   | [33] [34]                          | ●                     | ●                  | ●                | ●                     | ●             | ●                | ○                 | ○                       | ●          | ●                        | ●                 | ●                     | ●      | ●               | ●                                 | ●                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ○                      |                            |            |
| Physical Biometric                | Face Recognition                    | [37]                               | ●                     | ●                  | ●                | ●                     | ●             | ●                | ○                 | ●                       | ●          | ●                        | ●                 | ●                     | ●      | ●               | ●                                 | ●                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ○                      |                            |            |
| Physical Biometric                | Palm Vein Authentication System     | [38]                               | ●                     | ●                  | ●                | ●                     | ●             | ●                | ●                 | ●                       | ●          | ●                        | ●                 | ●                     | ●      | -               | ●                                 | ●                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ●                      |                            |            |
| Physical and Behavioral Biometric | Brain Wave Based Authentication     | [39]                               |                       | ●                  |                  |                       |               |                  |                   | -                       | ●          |                          |                   |                       |        |                 | ●                                 | ●                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ●                      |                            |            |
| Behavioral Biometric              | Gestures Recognition                | [40]                               | ●                     | ●                  | ●                |                       |               |                  | -                 |                         | ●          | ●                        | ●                 |                       |        |                 | ●                                 | ○                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ●                      |                            |            |
| Behavioral Biometric              | Keystroke-dynamics                  | [41]                               | ●                     | ●                  | ●                |                       | ●             | ○                |                   |                         | ●          | ●                        | ●                 |                       |        |                 | ●                                 | ○                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ●                      |                            |            |
| Behavioral Biometric              | Context Based Authentication System | [42],[43]                          | ●                     | ●                  | ●                | ●                     | ●             | ●                |                   |                         | ●          | ●                        | ●                 |                       |        |                 | ●                                 | ●                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ●                      |                            |            |
| MFA                               | One time password                   | [44]                               | ●                     | ●                  | ●                |                       | ●             |                  | ○                 |                         | ○          | ○                        | ○                 |                       |        | ●               | ●                                 | ○                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ●                      |                            |            |
| MFA                               | Google 2-Step                       | [45]                               |                       | ●                  |                  | ●                     | ○             | ○                | ○                 | ○                       | ○          | ○                        | ○                 |                       |        | ●               | ●                                 | ○                                   | ○                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  |                        |                            |            |
| MFA                               | Password and Location based         | [14]                               |                       | ●                  |                  | ●                     | ●             | ○                | ○                 | ●                       | ●          | ●                        | ●                 | ●                     |        | ●               |                                   | ●                                   | ●                               | ●                                 | ●                                 | ○                                       | ●                     | ●                  | ○                      |                            |            |
| MFA                               | LocBiometrics                       | [17]                               |                       | ●                  |                  | ●                     |               | ●                |                   |                         | ●          | ●                        | ●                 |                       |        | ●               | ●                                 | ○                                   | ●                               | ●                                 | ●                                 | ○                                       | ●                     | ●                  | ●                      |                            |            |
| MFA                               | This scheme                         |                                    | ●                     | ●                  | ●                |                       | ●             | ●                | ○                 |                         | ●          | ●                        | ●                 |                       |        | ●               | ●                                 | ○                                   | ●                               | ●                                 | ●                                 | ●                                       | ●                     | ●                  | ●                      |                            |            |