

## Speech understanding using deep learning

**3M™ M\*Modal Fluency Direct**, an advanced front-end speech recognition solution, offers broad dialectic capabilities and provides exceptional performance, regardless of geographic, ethnic or other speech characteristics. This 3M M\*Modal technology uses a unique, patented approach that combines speech recognition and natural language understanding (NLU) to more accurately understand the meaning, intent and context of the clinician's dictation.

3M Fluency Direct combines the collective experience of all 3M M\*Modal speech-driven solutions with an individual physician's speech profile trained and developed over time to provide an enriched speech recognition experience. 3M's approach combines both factorial modeling and deep neural networks (inspired by biological neural networks in animals), which allow the system to represent and model vastly different pronunciations and dictation patterns.

This technical capability is paired with actual physician dictations observed for more than a decade through a cloud-based deployment model. Previous dictations help build collective models that reflect common things physicians dictate. While dictating, each sound is compared to the collective model to validate statements for accuracy based on past documentation. The closer a sound or word is to previously known documentation, the more accurate and timelier the speech-to-text result is returned to the user.

While a user's initial experience is based on the collective experience of all 3M users, the system continually customizes the individual user profile without additional user activity or other training. The system adapts and continuously learns through observation and improves by capturing the target user's specific pronunciation and dictation patterns. This collected information is combined with data derived from more than 300,000 physician users, building a highly customized model for individual users in addition to using a collective model, resulting in exceptional, out-of-the-gate performance.

3M Fluency Direct provides an excellent user experience with immediate accuracy, speed and performance with multi-layer networks using deep learning technology that:

- Uses complex language modeling that is trained with an extensive data set of existing physician dictations
- Drives accuracy up and error rates down
- Accommodates all variety of dialects, individual speaking styles and medical specialties

### Call today

For more information on how 3M products and services can assist your organization, contact your 3M sales representative, call us toll-free at **800-367-2447**, or visit us online at **[www.3M.com/his](http://www.3M.com/his)**.