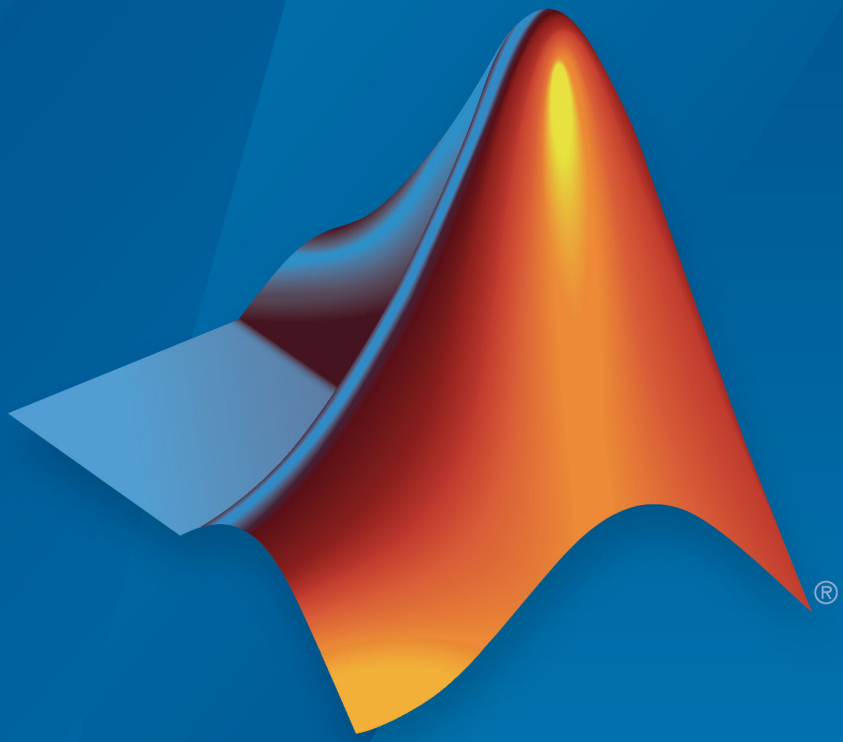
Text Analytics Toolbox™ Release Notes



MATLAB®

MathWorks®

How to Contact MathWorks

Latest news: `www.mathworks.com`

Sales and services: `www.mathworks.com/sales_and_services`

User community: `www.mathworks.com/matlabcentral`

Technical support: `www.mathworks.com/support/contact_us`

Phone: 508-647-7000

The MathWorks, Inc.
3 Apple Hill Drive
Natick, MA 01760-2098

Text Analytics Toolbox ™ Release Notes

Contents

R2018a

R2017b

R2018a

Multiword Phrases: Extract and count multiword phrases (n-grams) from tokenized text

You can extract and count multiword phrases (n-grams) from tokenized text using `bagOfNgrams` objects. For an example showing how to analyze text using n-grams, see "Analyze Text Data Using Multiword Phrases".

HTML Text: Extract text content from HTML pages.

Extract text directly from HTML code in a string using `extractHTMLText`. To extract text content from HTML files, use `extractFileText`.

Deep Learning: Learn how to use deep learning LSTM networks for text classification (requires Neural Network Toolbox)

An LSTM network is a type of deep learning network that can learn long-term dependencies between time steps of sequence data. By treating text data as sequences of words, you can use deep learning techniques with your text data.

To learn how to use deep learning long short-term memory (LSTM) networks for text classification, see "Classify Text Data Using Deep Learning".

Pattern Detection: Detect sentences, email addresses, and URLs in text

You can detect complex tokens such as email addresses, web addresses, hashtags, and at-mentions using the `'DetectPatterns'` option in `tokenizedDocument`. Use `splitSentences` to split text into sentences, and `addSentenceDetails` to add sentence information to tokenized documents. To get information about the tokens in a `tokenizedDocument` array, use `tokenDetails`.

Stochastic LDA Model Training: Fit LDA models to large datasets

Fit latent Dirichlet allocation (LDA) models to large datasets using stochastic approximate variational Bayes (SAVB) by specifying the `'Solver'` name-value pair to be `'savb'` in

`fitlda`. This solver is best suited for large datasets and can fit a good model in fewer passes through the data. For an example showing how to compare LDA solvers, see "Compare LDA Solvers".

Pretrained Word Embedding: Download pretrained fastText word embedding

You can download a pretrained fastText word embedding using `fastTextWordEmbedding`. This function requires Text Analytics Toolbox Model *for FastText English 16 Billion Token Word Embedding* support package. If this support package is not installed, the function provides a download link.

Word Frequency Counting: Count words and n-grams in parallel (requires Parallel Computing Toolbox)

You can create multiple bag-of-words or bag-of-n-grams models in parallel and combine them using `join`. For an example showing how to create a bag-of-words model in parallel, see "Create Bag-of-Words Model in Parallel".

Functionality Being Removed or Changed

Functionality	Result	Use Instead	Compatibility Considerations
`tokenizedDocument`	Still runs	Not applicable	In R2018a, `tokenizedDocument`, by default, detects complex tokens (email addresses, web addresses, hashtags, and at-mentions). In R2017b, `tokenizedDocument` splits complex tokens into multiple tokens. To reproduce this behavior, in `tokenizedDocument`, specify the `'DetectPatterns'` option to be `'none'`.

R2017b

Version: 1.0

New Features

Text Preprocessing: Prepare text for analysis by automatically extracting and preprocessing words from raw text

You can perform the following common character level preprocessing steps to prepare text data before splitting it into words:

- Erase HTML and XML tags using `eraseTags`.
- Erase URLs using `eraseURLs`.
- Erase punctuation using `erasePunctuation`.
- Convert HTML and XML entities into characters using `decodeHTMLEntities`.

After character level preprocessing, you can split text into words using `tokenizedDocument` which creates an array of `tokenizedDocument` objects. With a `tokenizedDocument` array, you can perform the following word level preprocessing steps:

- Remove specified words from an array of documents using `removeWords`.
- Remove a common list of stop words which are not useful for analysis (such as "a" and "the") using `removeWords` and `stopWords`.
- Remove long and short words using `removeLongWords` and `removeShortWords` respectively.
- Stem words using `normalizeWords`.

For an example showing how to preprocess text data and prepare for it for analysis, see Prepare Text Data for Analysis.

Machine Learning Algorithms: Discover topics and clusters of documents using Latent Dirichlet Allocation (LDA) and Latent Semantic Analysis (LSA)

You can analyze text data using the Latent Dirichlet Allocation topic model. Latent Dirichlet Allocation models a collection of documents as mixtures of topics.

Fit an `ldaModel` using `fitlda`. You can resume training using `resume`. Using `ldaModel` objects, you can perform the following tasks:

- Visualize topics and word importance of an LDA model using `wordcloud` and `topkwords`.

- Extract features, or reduce dimensionality using `transform`. This function transforms documents into the lower dimensional topic probability space.
- Predict top topics of documents using `predict`.
- Calculate document log probabilities and detect outliers using `logp`.

You can also use Latent Semantic Analysis to model your text data.

Fit an `lsaModel` using `fitlsa`. To use an LSA model as a feature extractor, or a dimension reducing tool, use `transform`. This function transforms documents into a lower dimensional semantic space.

For an example showing how to use LDA to analyze text data, see Analyze Text Data Using Topic Models. For more information on LSA models, see `lsaModel`.

Word Embeddings: Convert words to numeric vectors using word2vec, FastText, and GloVe word embedding models

Use word embeddings to discover relationships between words. Word embeddings model words as vectors in a fixed dimensional space. For example, a word embedding may learn the relationship "king" – "man" + "woman" = "queen".

Create a `WordEmbedding` object by using one of the following methods:

- Import word embedding files from word2vec, FastText, and GloVe using `readWordEmbedding`.
- Train your own word embeddings from text data using `trainWordEmbedding`.

With a `WordEmbedding` object, you can do the following:

- Map words to vectors and back using `word2vec` and `vec2word`.
- Write the word embedding to a file using `writeWordEmbedding`.

For an example showing how to explore word embeddings, see Visualize Word Embedding Using Text Scatter Plots.

Text Plots: Visualize text data using word clouds and text scatter plots

Text Analytics Toolbox extends the functionality of the `wordcloud` (MATLAB®) function. It adds support for the following tasks:

- Create word clouds directly from string. `wordcloud` automatically tokenizes, preprocesses, and counts word frequencies of string input.
- Create word clouds from bag-of-words models.
- Create word clouds from LDA topics.

You can also visualize text data using 2-D and 3-D text scatter plots. Use `textscatter` and `textscatter3` to plot words at specified coordinates of 2-D and 3-D scatter plots respectively.

For an example showing how to visualize collections of text data using word clouds, see Visualize Text Data Using Word Clouds.

Document Import: Read text from PDF and Microsoft Word files

You can extract text data directly from plain text, PDF, and Microsoft® Word files using `extractFileText`.

For an example showing how to extract text data from files and import it into MATLAB, see Extract Text Data From Files.

Text Statistics: Calculate word frequency and TF-IDF matrices from document collections

A bag-of-words model (also known as a term-frequency counter) records the number of times that words appear in each document of a collection.

Create a `bagOfWords` object using `bagOfWords`.

With a `bagOfWords` object, you can perform the following tasks:

- Encode documents as a matrix of word counts using `encode`.

- View the most frequent words using `topkwords`.
- Add and remove documents using `addDocument` and `removeDocument` respectively.
- Remove empty documents using `removeEmptyDocuments`.
- Remove infrequent words using `removeInfrequentWords`.

You can input `bagOfWords` objects directly into `fitlda`, `fitlsa`, and `wordcloud`.

You can create tf-idf matrices from a bag-of-words model using `tfidf`. A tf-idf matrix is a statistic that captures word importance in a collection of documents. It captures the number of times each word appear in a collection, and how many documents each word appears in.

For more information, see `bagOfWords`.

Word Normalization: Convert words to their word roots using the Porter stemming algorithm

To group different forms of English words by reducing them to a common stem, use `normalizeWords`. For example, use this function to reduce the words "walk", "walks", "walking" and "walk" all to their word root "walk". `normalizeWords` uses the Porter stemmer.

For more information, see `normalizeWords`.