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## Data in Brief

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## Data Article

## Longitudinal multiple sclerosis lesion segmentation data resource



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## ABSTRACT

The data presented in this article is related to the research article entitled “Longitudinal multiple sclerosis lesion segmentation: Resource and challenge” (Carass et al., 2017) [1]. In conjunction with the 2015 International Symposium on Biomedical Imaging, we organized a longitudinal multiple sclerosis (MS) lesion segmentation challenge providing training and test data to registered participants. The training data consists of five subjects with a mean of 4.4 ( $\pm 0.55$ ) time-points, and test data of fourteen subjects with a mean of 4.4 ( $\pm 0.67$ ) time-points. All 82 data sets had the white matter lesions associated with multiple sclerosis delineated by two human expert raters. The training data including multi-modal scans and manually delineated lesion masks is available for download.<sup>1</sup> In addition, the

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<sup>1</sup> The data and evaluation website is: <http://smart-stats-tools.org/lesion-challenge-2015>.

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testing data is also being made available in conjunction with a website for evaluating the automated analysis of the testing data.

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## Specifications Table

<b>Subject Area</b>	Neurology
<b>More Specific Subject Area</b>	Neuroimaging
<b>Type of Data</b>	Magnetic Resonance Images Specifically: $T_1$ -w MPRAGE $T_2$ -w & PD-w DSE $T_2$ -w FLAIR
<b>Data Format</b>	Raw and Processed
Experimental Factors	None
<b>Data Source Location</b>	The Johns Hopkins Hospital, Baltimore, MD 21287
<b>Data Accessibility</b>	Public download

## Value of the data

- This is currently the largest available public database of manually delineated MS lesions.
- All 82 data sets have been manually delineated by two raters.
- A unique multi-modal data set of MS lesion progression covering multiple time-points.
- A public evaluation website allows for the comparison of automated algorithms on the testing data.

## 1. Data

The data presented in this article is related to the research article entitled “Longitudinal multiple sclerosis lesion segmentation: Resource and challenge” [1]. The data consists of magnetic resonance (MR) images (MRI) divided into two cohorts: 1) Training Set; and 2) Test Set. The Training Set consists of five subjects, four of which had four time-points, while the fifth subject had five time-points. The Test Set includes fourteen subjects, ten of which had four time-points, three had five time-points, and one had six time-points. Two consecutive time-points are separated by approximately one year for all subjects. Table 1 includes a demo-graphic breakdown for the training and test data sets. The data does not supply the multiple sclerosis (MS) subtype of the subjects for either the training or the test data. The data is available for download from the Challenge Evaluation Website: <http://smart-stats-tools.org/lesion-challenge-2015>.

## 2. Methods

Each scan was imaged and preprocessed in the same manner, with data acquired on a 3.0 T MRI scanner (Philips Medical Systems, Best, The Netherlands) using the following sequences: a  $T_1$ -weighted ( $T_1$ -w) magnetization prepared rapid gradient echo (MPRAGE) with TR=10.3 ms, TE=6 ms, flip angle=8°, &  $0.82 \times 0.82 \times 1.17 \text{ mm}^3$  voxel size; a double spin echo (DSE) which produces the proton density weighted (PD-w) and  $T_2$ -weighted ( $T_2$ -w) images with TR=4177 ms, TE<sub>1</sub>=12.31 ms, TE<sub>2</sub>=80 ms, &  $0.82 \times 0.82 \times 2.2 \text{ mm}^3$  voxel size; and a  $T_2$ -w fluid attenuated inversion recovery (FLAIR) with

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