# Finding Genealogy Facts with Linguistic Analysis

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#### Semi-Structured Text

243314. Charles Christopher Lathrop, N. Y. City, b. 1817, d. 1865. son of Mary Ely and Gerard Lathrop; m. 1856. Mary Augusta Andruss 992 Broad St., Newark, N. J., who was b. 1825. dau. of Judge Caleb Halstead Andruss and Emma Sutherland Goble. Mrs. Lathrop died at her home, 992 Broad St., Newark, N. J., Friday morning, Nov. 4 1898. The funeral services were held at her residence on Monday, Nov. 7, 1898, at half-past two o'clock P. M. Their children:

- I. Charles Halstead, b. 1857, d. 1861
- 2. William Gerard, b. 1858, d. 1861
- 3. Theodore Andruss, b. 1860.
- 4. Emma Goble, b. 1862.

Miss Emma Goble Lathrop, official historian of the New York Chapter of the Daughters of the American Revolution, is one of the youngest members to hold office, but one whose intelligence and capability qualify her for such distinction.

# A Simple Ontology



#### **Unstructured Text**

Children of TAMES HARWOOD, No. 103. A. born July 20, 1005, in Eden, Vt. One 229.married ELIJAH SPENCER, Dec. 25, 1851. They had five children: Arvilla, born in 1852, is not living; Mariette, born Dec. 25, 1854, married Jonathan Snyder, have a family; Leverett, born Feb. 6, 1857, married Cora Smith, Nov. 2, 1879, had two children, Perry F. and Ida I. Leverett died May 21, 1910; Rosa E., born Jan. 13, 1860, married Emmett Byers, and have children; and Harrison, born about 1862, is not living. Elijah Spencer died in the Union army in 1863, and his seven married Ionarman Sources who was born in Ohio, July 25, 1823, by whom y had one born June 16, 1865, in DeKalb county, son. Ind., married Cora M. Thomas, Aug. 24, 1887, they reside in St. Joseph, Mich., five children. Mrs. Myra died in Allen county, Ind., Feb. 13, 187

### A More Complex Ontology



#### **OntoSoar Architecture**



#### **Two Cases**

• Case 1:

Charles Christopher Lathrop, N. Y. City, b. 1817, d. 1865, son of Mary Ely and Gerard Lathrop ;

• Case 2:

his widow married JONATHAN SQUIRES, who was born in Ohio, July 25, 1823, by whom she had one son, J. Wilbur, born June 16, 1865, in DeKalb county, Ind.

# Linguistic Analysis – Case 1A

Charles Christopher Lathrop, ..., b. 1817, d. 1865,



PL 2014 FHTW

### Linguistic Analysis– Case 1B

Charles Christopher Lathrop, ..., son of Mary Ely and Gerard Lathrop;



PL 2014 FHTW

### Extracting Meaning – Case 1

Charles Christopher Lathrop, N. Y. City, b. 1817, d. 1865, son of Mary Ely and Gerard Lathrop ;



# Linguistic Analysis– Case 2

his widow married JONATHAN SQUIRES, ..., by whom she had one son, J. Wilbur, born June 16, 1865, ... .



# Extracting Meaning – Case 2

his widow married JONATHAN SQUIRES, who was born in Ohio, July 25, 1823, by whom she had one son, J. Wilbur, born June 16, 1865, in DeKalb county, Ind.



#### **Meaning Structures Compared**

Charles Christopher Lathrop, N. Y. City, b. 1817, d. 1865, son of Mary Ely and Gerard Lathrop ;



his widow married JONATHAN SQUIRES, who was born in Ohio, July 25, 1823, by whom she had one son, J. Wilbur, born June 16, 1865, ... .



3/19/2014

#### Evaluation

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	Person Basic			> Upload ■ Existing ← of # → ○ ●
Name	BirthDate	DeathDate		84 GENEALOGICAL HISTORY.
JAMES HARWOOD		×		228. JAMES, born July 23, 1835, in Wayne county, Michigan. He married BRIDGET HACKETT, a sister of his
MYRA	July 26, 1835	Feb. 13, 1874		brother Edmund's wife, June 20, 1858. She died about
ITRA	July 26, 1655			1875, was a member of the Catholic Church. Mr. Harwood
ELIJAH SPENCER		×		died in Fenwick, Michigan, Aug. 19, 1910.
ONATHAN SQUIRES	July 25, 1823	×		Children of JAMES HARWOOD, NO. 103.
Wilbur	huma 40, 4005	×		
nugirv	June 16, 1865			229. MYRA, born July 26, 1835, in Eden, Vt. She married ELIJAH SPENCER, Dec. 25, 1851. They had five children:
Display Mode: Grid	Switch Add Recor	d		Arvilla, born in 1852, is not living; Mariette, born Dec. 25, 1854, married Jonathan Snyder, have a family; Leverett, born Feb. 6, 1857, married Cora Smith, Nov. 2, 1879, had two children, Perry F. and Ida I. Leverett died May 21,1910; Rosa E., born Jan. 13, 1860, married Emmett
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Display Mode: <b>Grid</b>	Form Edit Mode C	lear Form Save Form Save Data Actions n (Keyboard 'A')	Keyboard Shortcuts	25, 1854, married Jonathan Snyder, have a family; Leverett, born Feb. 6, 1857, married Cora Smith, Nov. 2, 1879, had two children, Perry F. and Ida I. Leverett died May 21,1910; Rosa E., born Jan. 13, 1860, married Emmett Byers, and have children; and Harrison, born about 1862, is not living. Elijah Spencer died in the Union army in 1863, and his widow married JONATHAN SQUIRES, who was born in Ohio, July 25, 1823, by whom she had one
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Display Mode: <b>Grid</b>	Form Edit Mode C Annotate selection Append annotation X Clear annotations	lear Form Save Form Save Data Actions n (Keyboard 'A') n (Keyboard 'S')	Keyboard Shortcuts Tab: next field Shift-Tab: previous field	25, 1854, married Jonathan Snyder, have a family; Leverett, born Feb. 6, 1857, married Cora Smith, Nov. 2, 1879, had two children, Perry F. and Ida I. Leverett died May 21,1910; Rosa E., born Jan. 13, 1860, married Emmett Byers, and have children; and Harrison, born about 1862, is not living. Elijah Spencer died in the Union army in 1863, and his widow married JONATHAN SQUIRES, who was born in Ohio, July 25, 1823, by whom she had one son, J. Wilbur, born June 16, 1865, in DeKalb county, Ind., married Cora M. Thomas, Aug. 24,1887, they reside
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Display Mode: <b>Grid</b>	Form Edit Mode C ✓ Annotate selection + Append annotations click on token: annot Alt-click on token: ann mouse-select & click. hold Ctrl(¥ for Mac): click on field: enter e	Actions         Save Data           Actions         n (Keyboard 'A')           n (Keyboard 'S')         (Keyboard 'D')           ate token (letters and digits only)         notate token (letters, digits & punctuation)           annotate selected text         append annotation on click or Alt-click           dit mode         Alt-click	Keyboard Shortcuts           Tab: next field           Shift-Tab: previous field           click on field & Esc: move focus to field           1-9: add 1-9 nested fields           w: Next field           q: Previous field           r: Repeat annotation           a: Annotate current selection	25, 1854, married Jonathan Snyder, have a family; Leverett, born Feb. 6, 1857, married Cora Smith, Nov. 2, 1879, had two children, Perry F. and Ida I. Leverett died May 21,1910; Rosa E., born Jan. 13, 1860, married Emmett Byers, and have children; and Harrison, born about 1862, is not living. Elijah Spencer died in the Union army in 1863, and his widow married JONATHAN SQUIRES, who was born in Ohio, July 25, 1823, by whom she had one son, J. Wilbur, born June 16, 1865, in DeKalb county, Ind., married Cora M. Thomas, Aug. 24,1887, they reside in St. Joseph, Mich., five children, Mrs. Myra Squires died in Allen county, Ind., Feb. 13, 1874. 230. HARRISON, born May 21, 1837, in Allen county, Ind. He enlisted Sept. 25, 1861, in the 44th regiment, Indiana volunteers, which went south from Indianapolis,
Display Mode: <b>Grid</b>	Form Edit Mode C Annotate selection + Append annotatio × Clear annotations click on token: annot Alt-click on token: ann mouse-select & click hold Ctrl(# for Mac):	Actions         Save Data           Actions         (Keyboard 'A')           n (Keyboard 'S')         (Keyboard 'D')           ate token (letters and digits only)         notate token (letters, digits & punctuation))           anotate selected text         append annotation on click or Alt-click           dit mode         it	Keyboard Shortcuts           Tab: next field           Shift-Tab: previous field           click on field & Esc: move focus to field           1-9: add 1-9 nested fields           w: Next field           q: Previous field           r. Repeat annotation	25, 1854, married Jonathan Snyder, have a family; Leverett, born Feb. 6, 1857, married Cora Smith, Nov. 2, 1879, had two children, Perry F. and Ida I. Leverett died May 21,1910; Rosa E., born Jan. 13, 1860, married Emmett Byers, and have children; and Harrison, born about 1862, is not living. Elijah Spencer died in the Union army in 1863, and his widow married JONATHAN SQUIRES, who was born in Ohio, July 25, 1823, by whom she had one son, J. Wilbur, born June 16, 1865, in DeKalb county, Ind., married Cora M. Thomas, Aug. 24,1887, they reside in St. Joseph, Mich., five children, Mrs. Myra Squires died in Allen county, Ind., Feb. 13, 1874. 230. HARRISON, born May 21, 1837, in Allen county, Ind. He enlisted Sept. 25, 1861, in the 44th regiment, Indiana

# Conclusions

#### Accomplishments

- Preprocessor/Segmenter
- Adapted LG Parser for genealogy text
- Built a construction grammar meaning analyzer
- Mapped meaning schemas to user-defined ontologies
- Integrated all into a single processing pipeline
- Partially implemented works well so far

#### **Future work**

- Complete implementation
- Evaluate on a broader corpus
- Explore using a named entity recognizer
- Build in much more linguistic knowledge
- Research how to make the system learn linguistic knowledge