# The Journey of NegEx: A Simple Algorithm's Travels Around the World

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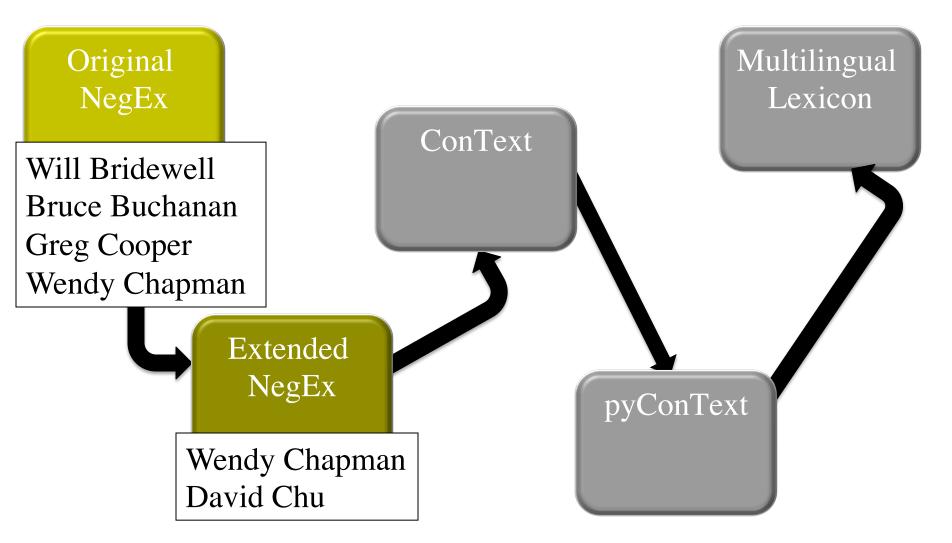
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Clinical condition: Cough

Negation: Negated

Clinical condition: Headache

Negation: NotNegated

scope

Patient denies cough but complains of headache.

modifier

termination term

target

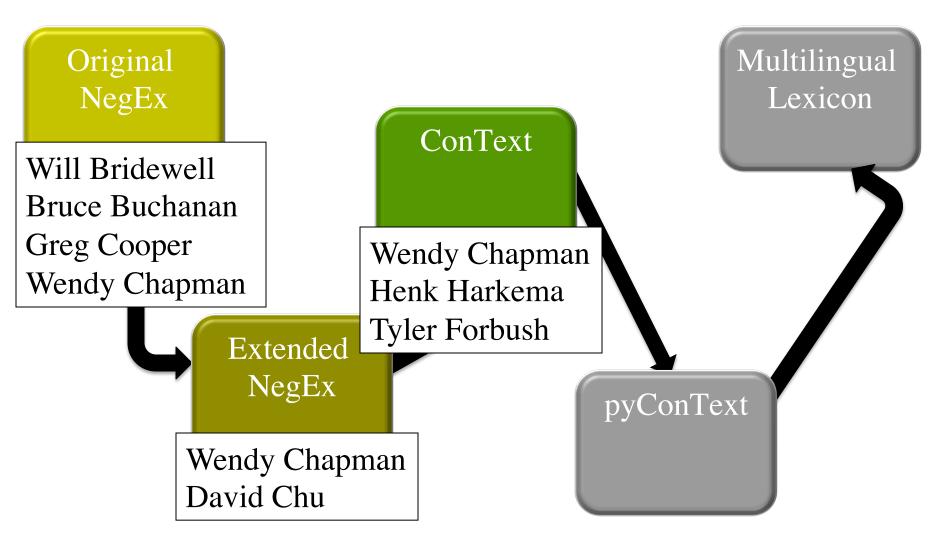
#### Scope: to end of sentence unless encounter termination term

Patient denies cough but complains of headache.

modifier termination term

target





#### ConText



- Same algorithm should work for other modifiers
  - Experiencer
  - Historical
  - Conditional
- Semantic groups of termination terms
  - Map termination groups to trigger groups

## ConText: Patient Experience

scope

Mother has CHF and patient presents today with chest pain.

trigger term

termination term

Clinical condition: CHF

Experiencer:

Other

#### ConText: Historical

scope

Past history of pneumonia presenting today with cough and fever.

trigger term

termination term

Clinical condition:

Temporality:

Pneumonia

Historical

## ConText: Conditional

scope

Patient should return if she experiences

fever or increased shortness of breath.

trigger term

Clinical condition: Fever

Temporality: Hypothetical

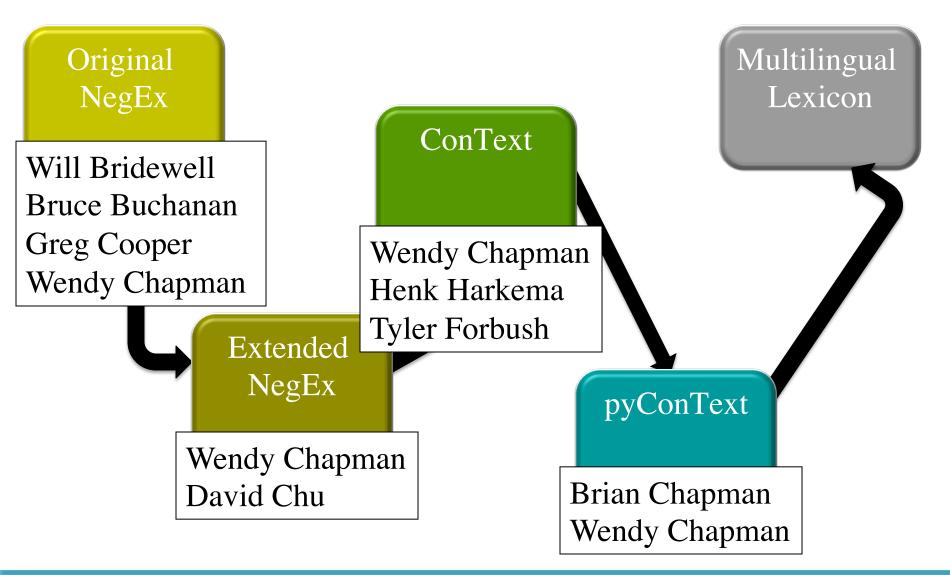
Clinical condition: Dyspnea

Temporality: Hypothetical

# **Termination Terms**

Type of Term	Examples	
Patient	Patient, patient's, who	
Presentation	Presents, complains, states, today	
Because	Since, because	
Which	Which	
ED	ED, emergency department	
But	But, however, yet, though	NegEx





## pyConText



- User defines
  - Modifiers
  - Targets
  - Terminators
- Regular expressions for targets



-Suggestive of <u>pe</u> although <u>evaluation</u> of the right lower lobe vessels is somewhat limited

What contextual value should be applied to PE? What contextual value should be applied to evaluation?

#### Example of additional modifiers



#### Limited (exam)

Suggestive of pe although <u>evaluation</u> of the right lower lobe vessels is somewhat <u>limited</u>

#### Reason for exam

Reason for exam: pulmonary embolism

#### Uncertainty

Suggestive of <u>pe</u> although evaluation of the right lower lobe vessels is somewhat limited





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Extended NegEx

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#### ConText

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#### Conclusion



- NegEx is imperfect
- NegEx is simple
  - Broad use
- NegEx relies on lexical cues
  - Can be machine learning features
- NegEx's modifier-target pattern useful for other modifiers as well
- Some other languages can use the pattern
  - Others may not be so amenable