

# Poetry and computer speech - Analysing and Reading Elizabethan and modern poets with SPARSAR

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# Overview

- Emotions Expressivity and TTS
  - Some demos on the web
- State of the art in NLP
  - State of the art in Semantics
- SPARSAR the system: some analyses
  - Discourse Relations and Argumentative Analysis
  - A demo of the expressive reader
- Shakespeare's Sonnets
  - Coping with contractions and violations
  - A demo of the expressive reader

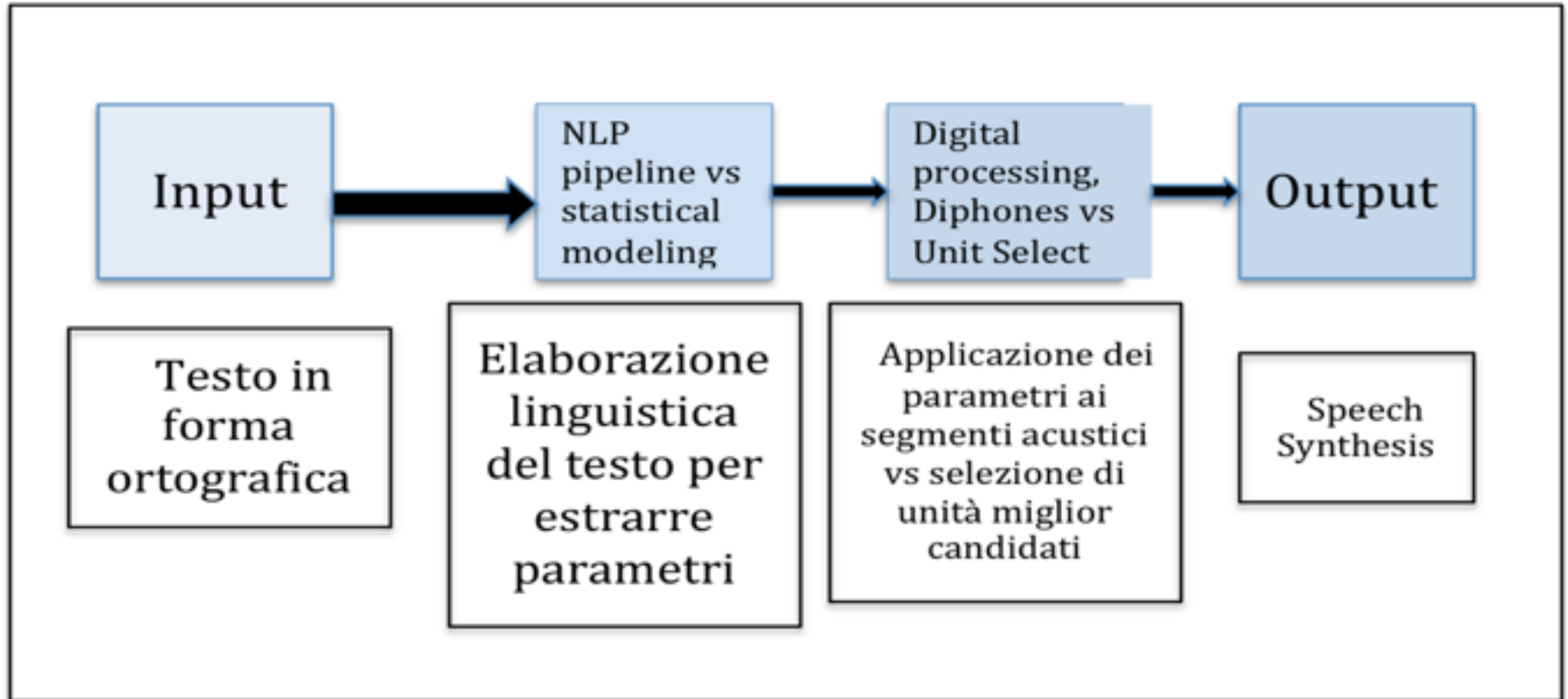
# Semantics and Pragmatics

- There is a general consensus on the need to provide “Natural Language Understanding” abilities for expressive TTS
- A rule-based system rather than a Machine Learning Approach: Semantics & Pragmatic features of texts and dialogues are **SPARSE**
- State of the art systems generating semantic and pragmatic representations, do they exist?
- And what kind of semantics and pragmatics is needed to produce expressive TTS?

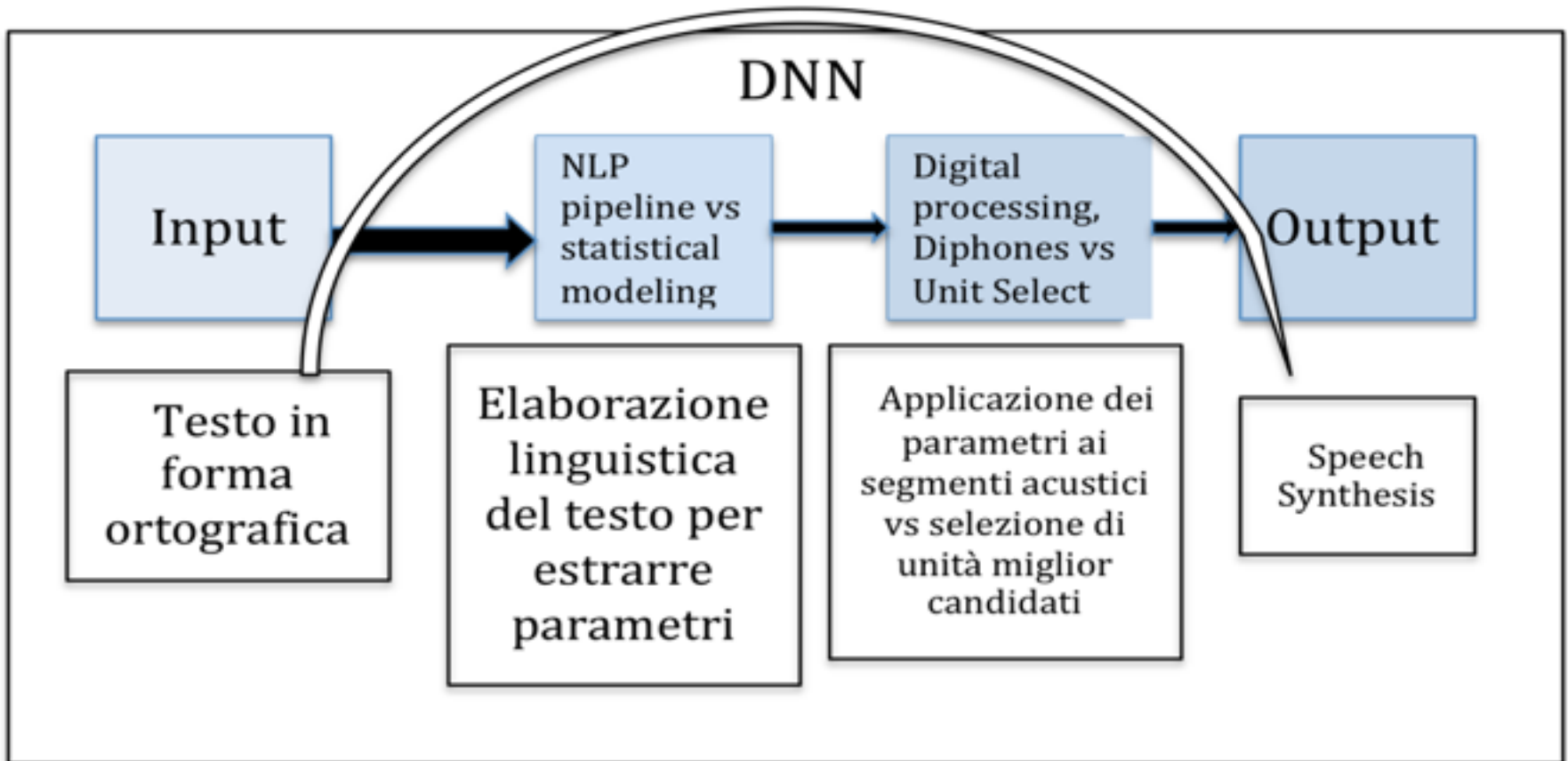
# Expressivity and TTS

- Total lack of expressivity in standard text-to-speech systems.
- Few expressive synthetic speech TTS are tuned to specific needs and unable to generalize
- Expressivity and Emotions generation
- Expressivity and Affective/Sentiment Analysis
- Expressivity in Storytelling

# TTS ARCHITECTURES

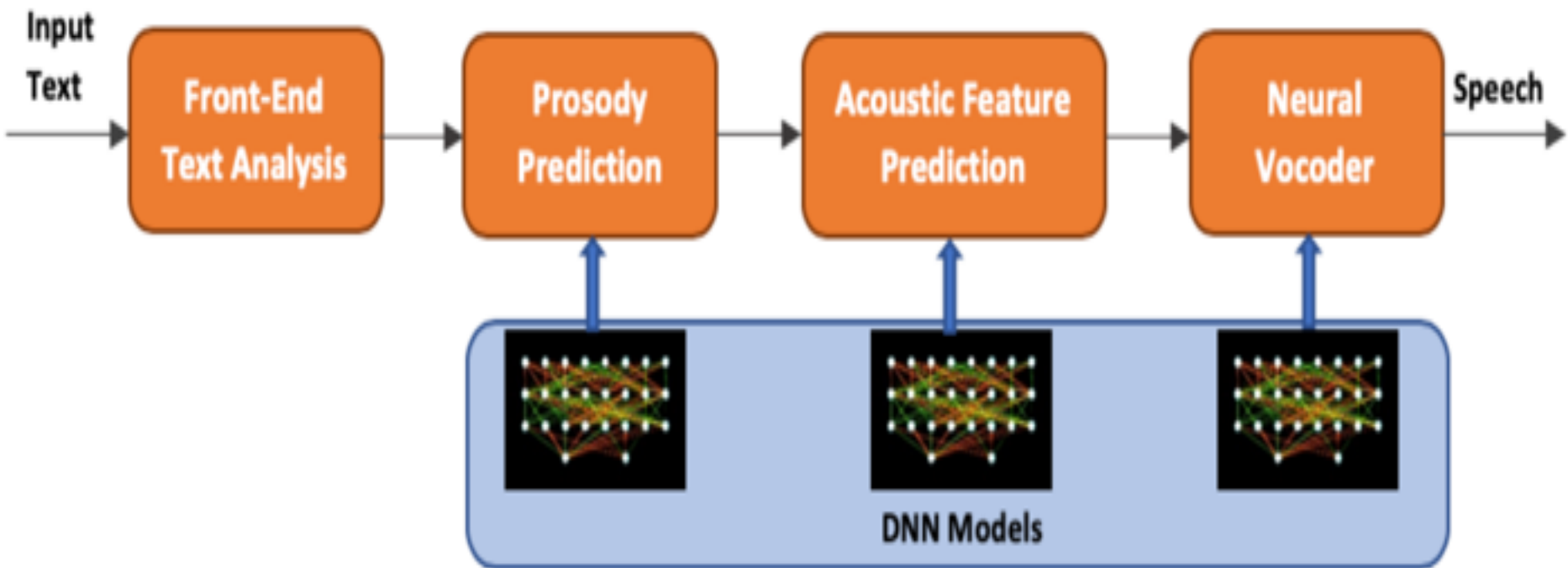


# TTS BY DNN



Input character sequence à Output a waveform

# IBM's DNN



# Loquendo and Dialogue Acts

Disbelief	<i>That's unbelievable!</i>
Surprise	<i>What a surprise!</i>
Regret	<i>I'm so sorry! ...</i>
Thanks	<i>Thanks a lot!</i>
Greetings	<i>Welcome! ...</i>
Apologies	<i>I'm sorry! ...</i>
Compliments	<i>Congratulations!</i>

**Table 1. Speech acts categories with exan**



# Prosodic Variations and Google's Tacotron's paper conclusion...

- To solve the prosody problem in TTS the attempt to create a statistical model, but speech variability is multilevel
  - Intonational Contour and range
  - Speaking Rate and where and how long should be pauses
  - Syllabic Prominence at Word Level
  - Voice Quality (??)
- **We'd also like to develop techniques to select appropriate prosody or speaking style automatically from context, using, for example, the integration of natural language understanding with TTS. (Google's Tacotron paper)**

# Edge

By [Sylvia Plath](#) 1963

The woman is perfected.  
Her dead

Body wears the smile of accomplishment,  
The illusion of a Greek necessity

Flows in the scrolls of her toga,  
Her bare

Feet seem to be saying:  
We have come so far, it is over.

Each dead child coiled, a white serpent,  
One at each little

Pitcher of milk, now empty  
She has folded

Them back into her body as petals  
Of a rose close when the garden

Stiffens and odors bleed  
From the sweet, deep throats of the night  
flower.

The moon has nothing to be sad about,  
Staring from her hood of bone.

She is used to this sort of thing.  
Her blacks crackle and drag.

# Limite/Bordo/Orlo/Margine

La donna ora è perfetta.  
Il suo corpo

morto indossa il sorriso della compiutezza,  
l'illusione di una greca necessità

sgorga nelle pieghe della sua toga,  
i suoi nudi

piedi sembrano dire:  
siamo arrivati fin qui, è la fine.

Ogni bimbo morto acciambellato, bianco  
serpente,  
ciascuno a una piccola

brocca di latte, ora vuota  
lei li ha riavvolti

di nuovo nel suo corpo come i petali  
di una rosa si chiudono quando il giardino

s'intorbidisce e i profumi sanguinano  
dalle dolci, profonde gole del fiore notturno.

La luna non ha nulla di cui esser triste,  
osserva fisso dal suo cappuccio d'osso.

E' assuefatta a questo tipo di cose.  
Il suo nero sipario si trascina e crepita.

# TTS Mistakes MarkUp

## Edge

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The moon has nothing to be sad about,  
Staring from her hood of bone.

She is used to this sort of thing.  
Her blacks crackle and drag.

Nuance

IBM-Watson

SPARSAR

# Some TTS systems on the web

<https://text-to-speech-demo.ng.bluemix.net/> -

<https://www.nuance.com/omni-channel-customer-engagement/voice-and-ivr/text-to-speech.html#!>

<http://www.fromtexttospeech.com/> -

<https://www.naturalreaders.com/online/> -

# Expressivity and Semantics in TTS

- As for storytelling, poetry requires modeling specific prosodic patterns (pitch, intensity and tempo)
- Prosodic variations
  - Including pauses of different duration
  - Add emotion to the voice by : Varying pitch and intensity
- BUT WHERE AND WHEN?? SEMANTICS & PRAGMATICS WILL TELL US

# Natural Language vs Computer Vision and Pattern Matching

- Emily Bender from Washington University about her work with Alexander Koller:
- “...much of the recent progress, though undoubtedly useful in several practical tasks, does not represent actual progress towards natural language understanding. More succinctly: a system trained on form alone cannot in principle learn meaning.”

# State of the Art in NLP and Semantics

- Tokenization
- Sentence Splitting
- Tagging
- Lemmatization
- Chunking
- Constituency Parsing for Syntactic Structures
- Dependency Parsing with Grammatical Functions

# State of the Art in NLP and Semantics

- Predicate-Argument Structures (Relations) with Shallow Dependency Parsing
  - Rule-Based Dependency Parsers
  - Statistical Probabilistic Dependency Parsers
- Predicate-Argument Structures (Relations) with Deep Dependency Parsing
  - Rule-Based Dependency Parsers
  - Includes Coreference Resolution Algorithm



# State of the Art in NLP and Semantics

- Question Answering Systems
  - Logical Form from WordNet Glosses
- Textual Entailment Systems
  - Event and Coreference Algorithms
  - Named Entities Recognition Algorithms
  - Semantic Similarity based on Distribution
  - Semantic Similarity based on Cooccurrence
  - Temporal Expressions Recognition
  - Negation and Scope Recognition
- Discourse Level Analysis & Generation
  - (Semantic) Discourse Structures
  - (Semantic) Discourse Relations

<http://www.sigsem.org/w/index.php?>

[title=STEP\\_2008\\_shared\\_task:\\_comparing\\_semantic\\_representations](http://www.sigsem.org/w/index.php?title=STEP_2008_shared_task:_comparing_semantic_representations)

# State of the Art in NLP and Semantics

- Argumentative Analysis
  - Telephone Dialogues in Call Centers
- Speech to Speech Translation
  - NESPOLE
    - Every turn described by IFs (one or several)
    - Interchange Format encodes a Semantic Dialogue Unit
    - Dialogue Acts
      - Speaker's Intention Goal and Need
      - Speech Act
      - Attitude
      - Main Predication
      - Discourse Variables



# STEP 2008 shared task: comparing semantic representations

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## Background

The STEP 2008 workshop features a "shared task" to compare semantic representations as output by state-of-the-art NLP systems. Participating systems are given a set of small texts, before the STEP workshop. The output of these

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# Systems Producing Deep Semantic Text Analysis

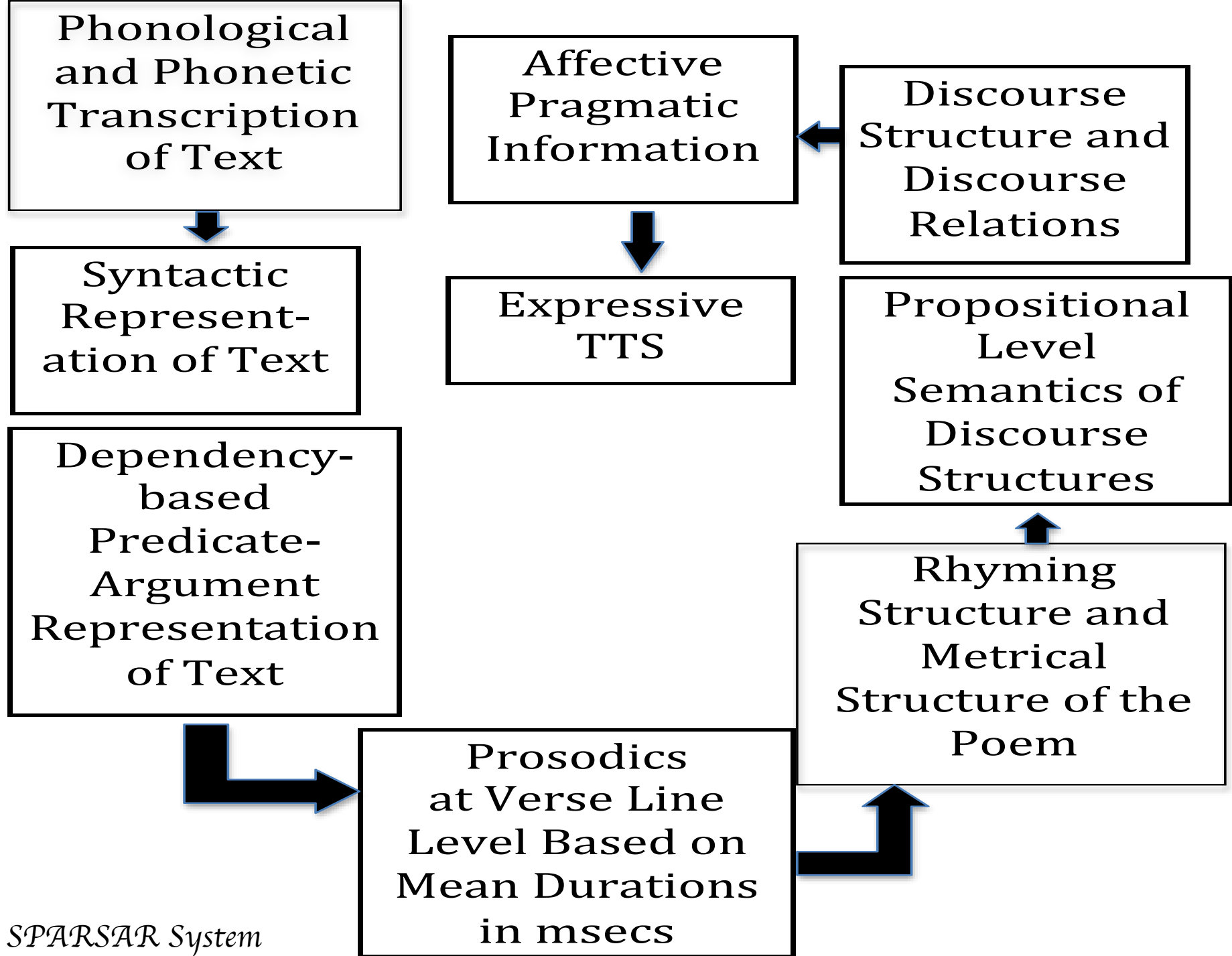
- <http://www.lymba.com/customized-ai-nlp-solutions/nlp-pipeline-service.html>



- <http://nlp.stanford.edu/software/corenlp.shtml>



- <https://allennlp.org/>
- <https://spacy.io/>
- <https://www.thomsonreuters.com/en/artificial-intelligence/natural-language-processing.html>



# *SPARSAR THREE LEVEL ALGORITHM*



**A. NLP SYSTEM: Tokenizer, sentence splitter, multiword analysis, NER, tagging, Chunker, Dependency parser**

**B. Semantic Measures, Concrete vs. Abstract and Eventive classes, Specific vs Collective And Ambiguous Concepts, Constituent Density, Propositional Level Density Measures; Affective Sentiment Analysis**

**C. Semantic Analysis at propositional level: it includes pronominal binding and anaphora Resolution; Predicate Argument structure with Semantic Roles; Informational and Discourse Structure with Discourse Relations and Relevance**



**D. Phonetic Translation, Verse and Stanza structure, Metrical Analysis; Prosodic Durational Measures at syllable level; Distribution of Mean Verse Duration**

**E. Rhythmic Structure from Rhyme Schemes, Associating Rhyme Labels to Each Verse and each Stanza; extension of the analysis comparing Stanza level RS at poem level**



**F. Transferring the two previous levels into Prosodic Markers for TTS On a Mac OSX using available voices in Slow+ Speaking Rate default value in TUNE Modality, modifying internal parameters**

[[pbas 38.0000; rate 160; volm +0.5]]edge . [[slnc 400]],[[rset 0]]  
[[pbas 44.0000; rate 140; volm +0.3]]the woman [[slnc 100]][[pbas 50.0000; rate 100; volm +0.5]]is [[rate 130; volm +0.5]]perfected[[slnc 20]],[[rset 0]]  
her [[pbas 36.0000; rate 110; volm -0.2]]dead body [[rset 0]]  
wears the smile of [[pbas 38.0000; rate 130; volm +0.3]]accomplishment[[slnc 300]],[[rset 0]] ,  
the illusion of a greek [[pbas 48.0000; rate 130; volm +0.9]]necessity[[slnc 50]],[[rset 0]]  
flows in the scrolls of [[rate 130; volm +0.5]]her toga , [[rate 130; volm +0.5]]  
her bare  
feet seem to be [[pbas 38.0000; rate 130; volm +0.3]]saying[[slnc 300]],[[rset 0]] : [[pbas 48.0000; rate 130; volm +0.9]]  
we have come so far , it [[slnc 100]][[pbas 50.0000; rate 100; volm +0.5]]is [[pbas 38.0000; rate 130; volm +0.3]]over[[slnc 300]],[[rset 0]] .  
[[rate 130; volm +0.5]]each dead child coiled , a white [[pbas 38.0000; rate 130; volm +0.3]]serpent[[slnc 300]],  
[[rset 0]] ,  
one at [[rate 130; volm +0.5]]each little  
pitcher of milk , now [[pbas 38.0000; rate 130; volm +0.3]]empty[[slnc 200]],[[rset 0]]  
she has [[rate 130; volm +0.5]]folded[[slnc 20]],[[rset 0]]  
them back into her body [[slnc 100]]as [[pbas 44.0000; rate 140; volm +0.3]]petals[[slnc 30]],[[rset 0]]  
of a rose close [[slnc 100;pbas 48.0000; rate 150; volm +0.3]]when the [[pbas 44.0000; rate 140; volm +0.3]]garden[[slnc 50]],[[rset 0]]  
stiffens [[slnc 100]]and odors [[rate 130; volm +0.5]]bleed[[slnc 20]],[[rset 0]]  
from the sweet , deep throats of the night [[pbas 38.0000; rate 130; volm +0.3]]flower[[slnc 300]],[[rset 0]] .  
the moon has [[rate 110; volm +0.3]]nothing[[slnc 100]],[[rset 0]] to be [[rate 130; volm +0.5]]sad about , [[slnc 100]][[pbas 50.0000; rate 100; volm +0.5]]  
staring from her hood of [[pbas 38.0000; rate 130; volm +0.3]]bone[[slnc 300]],[[rset 0]] .  
[[pbas 52.0000; rate 170; volm +0.3]]she [[slnc 100]][[pbas 50.0000; rate 100; volm +0.5]]is [[slnc 100]][[pbas 50.0000; rate 100; volm +0.5]]used to this sort of [[pbas 38.0000; rate 130; volm +0.3]]thing[[slnc 300]],[[rset 0]] .  
her blacks crackle [[slnc 100]]and [[pbas 38.0000; rate 130; volm +0.3]]drag[[slnc 300]],[[rset 0]] .

## Affect Editor

<div style="display: flex; align-items: center;"> <div style="width: 10px; height: 100px; background: black; margin-right: 5px;"></div> <div> <p>Afraid</p> <p>Angry</p> <p>Annoyed</p> <p>Disgusted</p> <p>Distraught</p> <p>Glad</p> <p>Indignant</p> <p>Mild</p> <p>Plaintive</p> <p>Pleasant</p> <p>Pouting</p> <p>Sad</p> <p>Surprised</p> </div> </div>	Sad		<div style="display: flex; align-items: center;"> <div style="width: 10px; height: 100px; background: black; margin-right: 5px;"></div> <div> <p>The train leaves at seven.</p> <p>I saw your name in the paper.</p> <p>I thought you really meant it.</p> <p>It's snowing.</p> </div> </div>
	PITCH	Accent Shape 6 Average Pitch 0 Contour Slope 0 Final Lowering -5 Pitch Range -5 Reference Line -1	SENTENCES
			<div style="display: flex; align-items: center;"> <div style="width: 10px; height: 100px; background: black; margin-right: 5px;"></div> <div> <p>[ S [ [AGENT I ] [ACTION saw ] [OBJECT your name ] ] [LOCATIVE in the paper ] ]</p> </div> </div>
			phrase structure
			<div style="display: flex; align-items: center;"> <div style="width: 10px; height: 100px; background: black; margin-right: 5px;"></div> <div> <p>( &lt;topline: 1&gt;&lt;lowering: 1&gt;&lt;rate: 1&gt; [FLUENT-1] I [HESITATION-1] [FLUENT-3] saw [FLUENT-3] your name [FLUENT-2] in [HESITATION-1] the paper . )</p> </div> </div>
			phonology
			<div style="display: flex; align-items: center;"> <div style="width: 10px; height: 100px; background: black; margin-right: 5px;"></div> <div> <p>( &lt;topline: 50&gt;&lt;lowering: 30&gt;&lt;rate: 122&gt; I saw your name in the paper . )</p> </div> </div>
			Dectalk phonology
			<div style="display: flex; align-items: center;"> <div style="width: 10px; height: 100px; background: black; margin-right: 5px;"></div> <div> <p>[ :dv pr 50 as 30 :ra 122 ] I [IX_&lt;185&gt;] [ ' ]saw [AX_&lt;287&gt;] your [N`EYM][MHX&lt;5&gt;_&lt;236&gt;] in[N&lt;45&gt;_ &lt;185&gt;] the [PB][ ' ]paper[R&lt;15&gt;] .</p> </div> </div>
			Dectalk string
EMOTIONS			



# **PROSODIC MARKERS INDUCTION**

## **PAUSE INSERTION:**

- a word is a syntactic head (either at constituency or dependency level)**
- a word is a quantifier, a quantified adverbial, or marks the beginning of a quantified expression**
- a word is a discourse marker and indicates the beginning of a subordinate clause**
- a word is a SUBJect head**

## **RHYTHMIC CONTROL:**

- the title**
- first and last line of the poem**
- a word marks the end of a line and is (not) followed by punctuation**
- a word is the first word of a line and coincides with a new stanza, and is preceded by punctuation**
- word stress demotion for words dependent on a following head**

**The rules address the following information:**

- the title**
- the first line of the poem**
- the last line of the poem**
- a word is one of the phonetically spelled out words**
- a word is the last word of a sentence and is followed by an exclamation mark**
- a word is the first word of an interrogative sentence**
- a word is a syntactic head (either at constituency or dependency level)**
- a word is a quantifier, or marks the beginning of a quantified expression**
- a word is a SUBject head – so marked by the dependency parser**
- a word marks the end of a line, is not followed by punctuation and is ( is not ) the end of a clause**
- a word marks the end of a stanza but is not the end of a clause and is in enjambement**
- a word is the first word of a line and coincides with a new stanza and is preceded by punctuation**
- a sentence is a frozen or a formulaic expression with specific pragmatic content specifically encoded**
- a sentence introduce new Topic, a Change, Foreground Relevance as computed by semantics and discourse relations**
- a sentence is dependent in Discourse Structure and its Move is Down or Same Level**
- a discourse marker indicates the beginning of a subordinate clause**
- a word is a negative affective word and is included in a dependency structure with a following head**

# **PROSODIC MARKERS INDUCTION**

## **INTONATIONAL CONTROL:**

- a word is the first/last word of a sentence which is an exclamative**
- a word is the first/last word of a sentence which is an interrogative and is (not) the question constituent**
- a line is part of a sentence which is a frozen or formulaic expression with specific pragmatic content and is exceptionally encoded**
- a line is part of a sentence that introduces a new Topic, a Change, a Foreground Relevance content as computed by the semantics in Discourse Relations**
- a line is part of a sentence and is dependent in Discourse Structure and its Move is Down or Same Level**

## **PHONETIC SEGMENTAL CONTROL:**

- a word is one of a list of phonetically spelled out words which are wrongly composed by the TTS**
- an expression or utterance is a frozen or formulaic expression and requires specialized intonational and phonetic controls**

# PROPOSITIONAL SEMANTICS

Sent_ No.	Clause No.	Subject_ Rel_	Disc_ Tense	Pred	Relevance	Disc_ Move	Disc_Struct_ Attach_Node
edge_6,	33,	objective,	narration,	pres,	crackle,	background,	level, down(26-33)).
edge_6,	32,	objective,	narration,	pres,	drag,	background,	level, down(26-32)).
edge_5,	26,	objective,	cause,	perf,	use,	foreground,	up, to(1-26)).
edge_4,	21,	objective,	narration,	pres,	be,	background,	level, down(16-21)).
edge_4,	20,	objective,	narration,	pres,	have,	background,	level, down(16-20)).
edge_3,	16,	objective,	narration,	past,	bleed,	foreground,	up, to(1-16)).
edge_3,	15,	objective,	narration,	pres,	close,	background,	down, down(11-15)).
edge_3,	14,	objective,	narration,	perf,	fold,	background,	level, level(11-14)).
edge_2,	11,	objective,	narration,	pres,	bare,	background,	level, level(1-11)).
edge_2,	10,	objective,	narration,	pres,	be,	background,	level, level(1-10)).
edge_2,	9,	objective,	result,	pres,	flow,	background,	down, down(1-9)).
edge_2,	8,	objective,	narration,	pres,	have,	background,	level, level(1-8)).
edge_2,	7,	objective,	narration,	pres,	have,	background,	level, level(1-7)).
edge_2,	5,	objective,	narration,	past,	say,	foreground,	up, to(1-5)).
edge_2,	4,	objective,	narration,	pres,	seem,	background,	level, level(1-4)).
edge_2,	3,	objective,	narration,	pres,	wear,	background,	level, level(1-3)).
edge_2,	6,	objective,	narration,	perf,	perfect,	foreground,	down, down(1-6)).
edge_1,	1,	objective,	setting,	nil,	edge,	background,	up, down(nil-1)).

# PROPOSITIONAL SEMANTICS

Clause No.	Funct/ Role	View	Factivity	Change	Relevance	Aspect	Pred	Tense	Disc_ Rel_	Subject_
33	coord/prop	external	factive	null	background	activity	crackle	pres	narration	objective
32	coord/prop	external	factive	null	background	activity	drag	pres	narration	objective
26	main/prop	external	factive	culmintd	foregrnd	activity	use	perf	cause	objective
21	main/prop	external	factive	null	background	activity	be	pres	narration	objective
20	main/prop	external	factive	null	background	activity	have	pres	narration	objective
16	coord/prop	external	factive	culmintd	foregrnd	activity	bleed	past	narration	objective
15	main/prop	external	factive	null	background	activity	close	pres	narration	objective
14	main/prop	external	factive	null	background	activity	fold	perf	narration	objective
11	main/prop	external	factive	null	background	activity	bare	pres	narration	objective
10	main/prop	external	factive	null	background	activity	be	pres	narration	objective
9	main/prop	external	factive	null	background	activity	flow	pres	result	objective
8	main/prop	external	factive	null	background	activity	have	pres	narration	objective
7	main/prop	external	factive	null	background	activity	have	pres	narration	objective
6	main/prop	external	factive	culmintd	foregrnd	activity	perfect	perf	result	objective
5	main/prop	external	factive	culmintd	foregrnd	activity	say	past	narration	objective
4	main/prop	external	factive	null	background	activity	seem	pres	narration	objective
3	main/prop	external	factive	null	background	activity	wear	pres	narration	objective
1	xcomp/prop	internal	factive	null	background	state	edge	nil	setting	objective

# DISCOURSE SEMANTICS

Topic Type	Clause No.	Pred	Semant_ Id_	M-Feats Per,Gen,Num	Semantic Inherent Feats	Semantic Role
main,	1,	edge,	id1,	[3, neu, sing, [abstrct, legal, nquant, objct],		theme_bound]
main,	14,	woman,	id2,	[3, fem, sing, [any, relat, social, hum],		theme]
second,	14,	garden,	id3,	[3, neu, plur, [instit, objct, instrum],		agent]
poten,	14,	child,	id4,	[3, neu, sing, [any, activ, body_part, objct, relat, social, instrum, hum],		actor]
poten,	14,	serpent,	id5,	[3, neu, sing, [animt, objct, instrum],		theme]
poten,	14,	throat,	id6,	[3, neu, plur, [body_part, objct, instrum, hum],		loc_origin]
poten,	14,	stiffen,	id7,	[3, neu, plur, [instit],		goal]
poten,	14,	body,	id8,	[3, neu, sing, [abstrct, activ, body_part, inform, instit, place, objct, instrum, hum],		loc_direct]
poten,	14,	pitcher,	id9,	[3, mas, sing, [activ, inform, nquant, objct, relat, social, instrum, hum],		specif]
poten,	14,	garden,	id3,	[3, neu, plur, [instit, objct, instrum],		attr]
poten,	14,	milk,	id10,	[3, neu, sing, [body_part, edible, objct, hum],		specif]
poten,	14,	odor,	id11,	[3, neu, plur, [abstrct, state],		agent]
poten,	14,	flower,	id12,	[3, neu, sing, [plant, time],		theme]
poten,	14,	night,	id13,	[3, neu, sing, [state, time],		specif]
main,	20,	hood,	id14,	[3, mas, sing, [objct, instrum, hum],		loc_origin]
poten,	20,	moon,	id15,	[3, neu, sing, [event, place, objct, time],		experiencer]
poten,	20,	nothing,	id16,	[3, nil, nil, [abstrct, inform, objct],		theme_bound]
second,	26,	this,	id17,	[3, mas, sing, [objct, hum],		goal]
poten,	26,	sort_of,	id18,	[3, nil, nil, [abstrct, activ, inform, relat, social, state, tecno, hum],		attr]

## PART II

- Shakespeare's Sonnets

# Shakespeare's Sonnets

Total No. of Tokens 18283

Total No. of Types 3085

Type/Token Ratio 16.87%

No. Hapax Legomena 1724

No. Rare Words 2441

Rare Words are the union of all, Trislegomena, Dislegomena and Hapax Legomena.

Hapax Legomena or Unique words cover 55.58% of Types, and Rare Words cover 79.12%.



# Comparing with best English poets

<b>Poets/Occurrences</b>	<b>Tokens</b>	<b>Types</b>	<b>VR</b>
<b>Francis Webb</b>	66965	12363	18.64
<b>Anne Sexton</b>	36501	5471	15.73
<b>Emily Dickinson</b>	31873	4503	14.13
<b>T.S.Eliot</b>	29144	5026	17.24
<b>Sylvia Plath</b>	28239	6166	21.84
<b>Elizabeth Bishop</b>	19047	4156	21.82
<b>Robert Frost</b>	21306	3251	15.26
<b>Walt Whitman</b>	76047	10946	14.39
<b>W.B.Yeats</b>	131485	10666	8.11
<b>Wall Street Journal</b>	1061166	28219	2.71
<b>Total/Mean Poets</b>	440607	62548	14.20

Table 2. Quantitative evaluation of Vocabulary Richness (1)

TRANSPOSING MEANING INTO IMMANENCE: THE POETRY OF FRANCIS WEBB

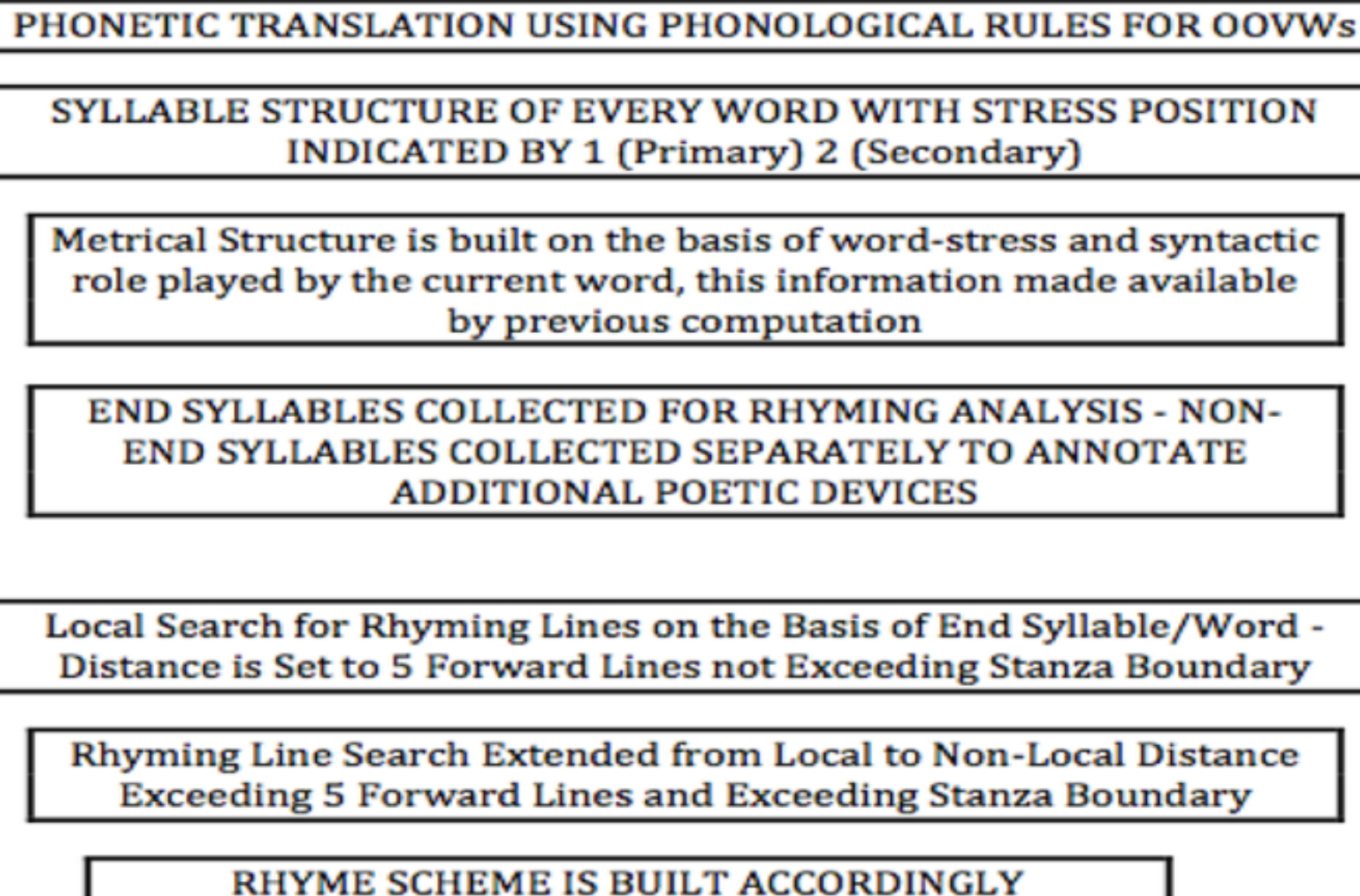
<http://www.rivistadistudiitaliani.it/articolo.php?id=1709>

# Elizabethan Sonnet: Rhyme Scheme and Meter

- ABAB-CDCD-EFEF-GG
- That is alternate rhymes - all sonnets excluding 99 (15 lines chained rhymes) + perfect rhyme and 126 with 12 lines
- Three quatrains of deca/endecasyllables plus a final couplet excluding 145 (tetrameter foot)
- Iambic pentameter is guaranteed by presence of contractions and marked stressed syllables

# English Rhymes

Identical Rhyme	-	pair/pear
Perfect Masculine	-	rhyme/sublime
Perfect Feminine	-	picky/tricky
Perfect Dactylic	-	gravity/depravity
Semirhyme	-	end/bending
Syllabic Rhyme	-	wing/caring
Consonant Slant Rhyme	-	years/yours
Vowel Slant Rhyme	-	eyes/light
Pararhyme	-	tell/tall/tail
Syllabic 2 Rhyme	-	restless/westward
Eye Rhyme	-	cough/bough ; daughter/laughter
Forced Rhyme	-	one/thumb
Structural Rhyme	-	fend/last



**Figure 1.** The Rhythm and Rhyme Module of SPARSAR Poetic Analyzer

# Computing Meter and Rhyme

- **Four Difficult tasks that do not lend themselves to a statistical approach**
  - **First task: resolving contractions**
  - **Second task: marked (un)stressed syllables – preventing elision**
  - **Third task: rhyme violations**
  - **Fourth task: homographs non homophones (different category) *lives***
  - **Fifth task: homographs non homophones (same category EME pronunciation) *desert***

# Contractions

- 's, 'd, 'n, 'st, 't, (putt'st)
- 'rous
- 'fore, 'gainst, 'tis, 'twixt, 'greeing,
- o'er, ne'er, bett'ring, whate'er, sland'ring, whoe'er,
- o'ercharg'd
- Overall 921 contractions
- 255 are 's and 167 are 'd

# Contractions

- Contractions are necessary to respect the metrical structure of the line
- Contractions require a reconstruction of the contracted word in order to be processed by the morphology and the syntax
- However the original contracted wordform must be restored in the grapheme-to-phoneme conversion step
- The word to be pronounced is a non-word non existing in any dictionary which must be created phonetically

# Preventing elision

- In some cases – less than 40 – a syllable must be preserved from being elided
- This happens every time a word ends with an unstressed syllable
- In order to preserve the syllable for metrical reason, the vowel (mainly /e/) is marked with an orthographic grave accent sign : è



# Some examples from Sonnet 46

To side this title is impanelled

- ^ - ^ - ^ - ^ - ^

A quest of thoughts, all tenants to the heart

- ^ - ^ - ^ - ^ - ^

And by their verdict is determined

- ^ - ^ - ^ - ^ - ^

The clear eye's moiety, and the dear heart's part.

- ^ - ^ - ^ - ^ - ^

tə cəɪde θɪs tætl̩ ɪs ɪmpænɪld

ə kwest əv θɔt̩ts, ɔ:l tenənts tə ðə hɑ:t,

ən bæɪ ðeɪ vɜ:dɪkt ɪs dɪtɜ:mɪnd

ðə kli:ɹ əɪz məɪt̩i, ænd ðə di:ɹ hɑ:ts pɑ:t.

# Rhyme Violations

- There are over 100 violations of the rhyme scheme
- in fact they hide the instability of Early Modern English(EME) pronunciation
- If we stick to Modern English a violation ensues
- David Crystal and OP <http://originalpronunciation.com/>
- The suggestion for finding the evidence in rhyming conventions

Delmonte R. and N: Busetto, 2020, Rhyme Repetition and Rhyme Scheme Violations in Shakespeare's Sonnets: a Quantitative Study, presented to LREC.

## SONETTO 1

From fairest creatures we desire increase,  
That thereby beauty's rose might never **die**,  
But as the ripper should by time decease,  
His tender heir might bear his **memory**:

.....

Thou that art now the world's fresh **ornament**,  
And only herald to the gaudy spring,  
Within thine own bud buriest thy **content**,  
And tender churl mak'st waste in niggarding:

## SONETTO 10

O change thy thought, that I may change my mind,  
Shall hate be fairer lodged than gentle **love**?  
Be as thy presence is gracious and kind,  
Or to thy self at least kind-hearted **prove**,

## SONETTO 12

When lofty trees I see barren of leaves,  
Which erst from heat did canopy the **herd**  
And summer's green all girded up in sheaves  
Borne on the bier with white and bristly **beard**:

## SONETTO 94

They that have power to hurt and will do **none**,  
That do not do the thing they most do show,  
Who, moving others, are themselves as **stone**,  
Unmoved, cold, and to temptation slow,

.....

The summer's flower is to the summer sweet,  
Though to itself it only live and **die**,  
But if that flower with base infection meet,  
The basest weed outbraves his **dignity**:

.....

## SONETTO 145

.....

Straight in her heart did mercy **come**,  
Chiding that tongue that ever sweet  
Was used in giving gentle **doom**,  
And taught it thus anew to greet:  
'I hate' she alter'd with an **end**,  
That follow'd it as gentle day  
Doth follow night, who like a **fiend**  
From heaven to hell is flown away;

.....

Sonetto 66  
di William Shakespeare

Stanco di tutto ciò, imploro quieta morte:  
vedere il merito nascere mendico,  
e l'indigente nulla d'orpelli agghindato,  
e la fede più pura misera, spergiurata,  
e l'onore dorato a indegni attribuito,  
e casta virtù da infami commerciata,  
e la vera perfezione a torto diffamata,  
e la forza da un potere zoppo menomata,  
e il talento dall'autorità zittito,  
e la follia (finto dottor) frenar l'acume,  
e la pura onestà fatta passar per stolta,  
e il bene schiavo del male generale.

Stanco di tutto ciò, da ciò vorrei partirmi,  
ma se morissi lascerei solo il mio amore.

Sonnet 66  
by William Shakespeare.

Tir'd with all these for restful death I cry,  
As to behold desert a beggar born,  
And needy nothing trimm'd in jollity,  
And purest faith unhappily forsworn,  
And gilded honour shamefully misplac'd,  
And maiden virtue rudely strumpeted,  
And right perfection wrongfully disgrac'd,  
And strength by limping sway disabled,  
And art made tongue-tied by authority,  
And folly (doctor-like) controlling skill,  
And simple truth miscall'd simplicity,  
And captive good attending captain ill.  
Tir'd with all these, from these would I be gone,  
Save that to die, I leave my love alone.

## Omaggio a Shakespeare Poesia, musica e computer

Giovedì 12 maggio 2016, ore 16.00

Biblioteca Nazionale Marciana - Sala dei Filosofi Piazzetta S. Marco 13, Venezia

Luigi Vero Tarca, moderatore

h. 16.00

Valerio De Scarpis, *Sluggenti identità nella musica dei Sonetti*

Dario Calimani, *I Sonetti e la carne*

Rodolfo Delmonte, *Il computer e la poesia*

h. 17.00

Aperitivo offerto dalla Cantina Bisol di Valdobbiadene

h. 17.15

**I sonetti 20 e 66**

Dario Calimani, *Nel cuore del sonetto*

Rodolfo Delmonte, *La voce del sonetto*

Claudio Ambrosini, *Musicare Shakespeare*

h. 18.00

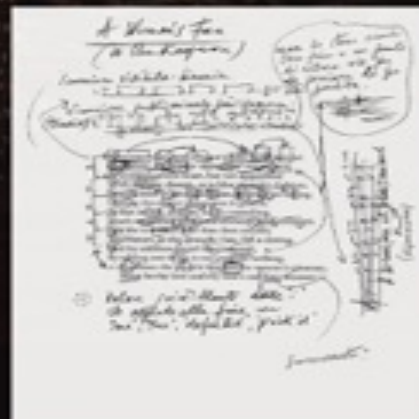
**Concerto di Madrigali rinascimentali**

Musiche di Giovanni Giacomo Gastoldi, Thomas Morley, John Wilbye  
Claudio Monteverdi, Thomas Tallis, Michael Cavendish, John Dowland  
Henry Youll, Thomas Tomkins, John Mundy, Henry VIII  
e

Claudio Ambrosini

**Two Shakespeare's Sonnets** - prima esecuzione mondiale

Esegue lo ZERO VOCAL ENSEMBLE, ottetto vocale a cappella  
(Eva Macaggi, Ai Nagasue, Elisa Bonazzi, Matilde Lazzaroni,  
Sergio Martella, Fabio Gentili, Giacomo Serra, Paolo Marchini)



## SYNTAX and INTONATION of Sonnet 66

Tir'd with all these for restful death I cry

As to behold *desert* a beggar born,

And needy nothing trimmed in jollity,

And purest faith unhappily forsworn,

And gilded honour shamefully misplaced,

And maiden virtue rudely strumpeted,

And right perfection wrongfully disgraced,

And strength by limping sway *disabled*

And art made tongue-tied by authority,

And folly (doctor-like) controlling skill,

And simple truth miscalled simplicity,

And captive good attending captain ill.

Tir'd with all these, from these would I be gone,

Save that to die, I leave my love alone.

Sir John Gielgud



# Sonnet 66

## Demo *SPARSAR*

Alex Raw

Daniel Raw

Alex Sparsar

Daniel Sparsar