

English STD 2006 Results

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National Institute of Standards and Technology
IAD

Spoken Term Detection Workshop
December 14-15, 2006

Outline

- 1 **Participants**
- 2 **Terms Richness**
- 3 **Domain Analyses**
 - BNEWS
 - CTS
 - CONFMTG
 - Overview
- 4 **Conditional Analyses**
 - Number of words
 - Syllables quantile
 - Occurrence across domains

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Submissions

Complete Domain Submissions		
Site ID	Site Name	# of Submissions
BUT	Brno University of Technology	4 (1p,3c)
IBM	IBM	4 (1p,3c)
IDIAP	Institut Dalle Molle d'Intelligence Artificielle Perceptive	1 (1p,0c)
OGI	OGI School of Science & Technology	1 (1p,0c)
QUT	Queensland University of Technology	3 (1p,2c)
SRI	SRI International	1 (1p,0c)
<i>STBU</i>	<i>Stellenbosch & Brno University Collaboration</i>	<i>1 (1p,0c)</i>
STELL	Stellenbosch University	1 (1p,0c)
TUB	Technischen Universität Berlin	2 (1p,1c)
9		18 (9p,9c)

Partial Domain Submissions <i>CTS only</i>		
Site ID	Site Name	# of Submissions
BBN	BBN Technologies	2 (1p,1c)
DOD	Department of Defense	2 (1p,1c)

p: Primary submission

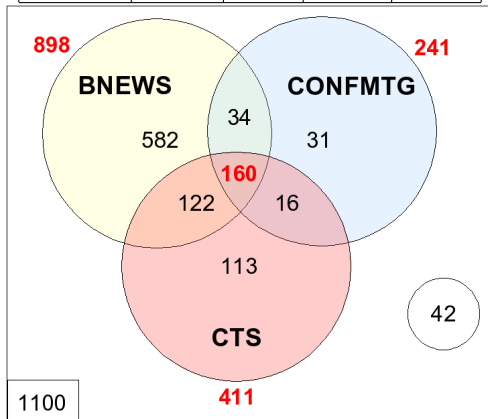
c: Contrastive submission

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Terms and Occurrences

Domain	# Terms	# Occ.	Speech Hours	Occ./Hr
BNEWS	898	4893	2.212	2211.66
CTS	411	5856	2.993	1956.78
CONFMTG	241	3672	2.098	1750.06



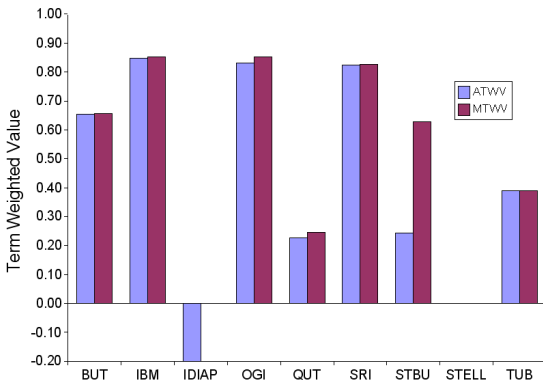
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Actual and Maximum Term Weighted Value

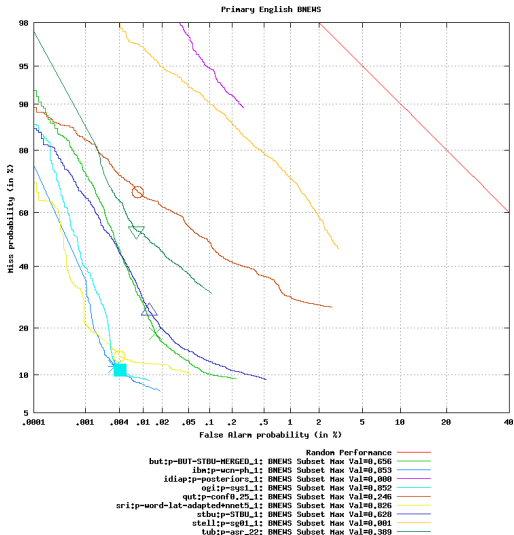
Site	ATWV	MTWV
BUT	0.6541	0.6558
IBM	0.8485	0.8532
IDIAP	-2.7139	0.0000
OGI	0.8323	0.8516
QUT	0.2265	0.2459
SRI	0.8238	0.8258
STBU	0.2434	0.6278
STELL	0.0000	0.0006
TUB	0.3890	0.3894

ATWV: Actual Term Weighted Value
MTWV: Maximum Term Weighted Value



BNEWS

DET Curve

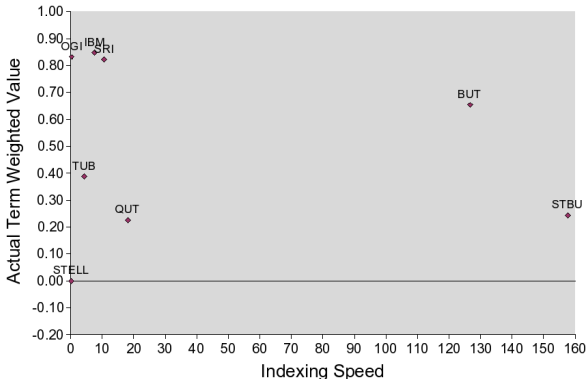


Indexing Speed vs. ATWV

Site	Indexing Speed	ATWV
BUT	126.7596	0.6541
IBM	7.5627	0.8485
IDIAP	0.2859	-2.7139
OGI	0.2891	0.8323
QUT	18.0884	0.2265
SRI	10.6555	0.8238
STBU	157.6593	0.2434
STELL	0.1680	0.0000
TUB	4.3897	0.3890

Indexing Speed Unit:

Processing Hours per Hours of Speech

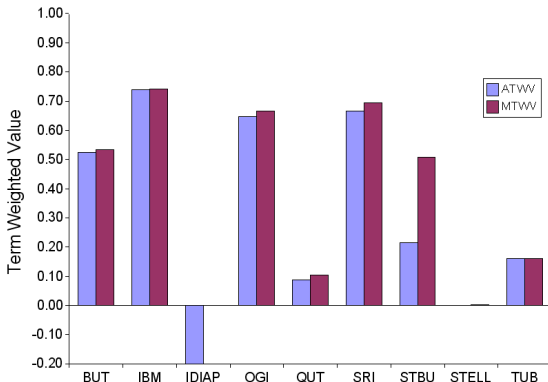


CTS

Actual and Maximum Term Weighted Value

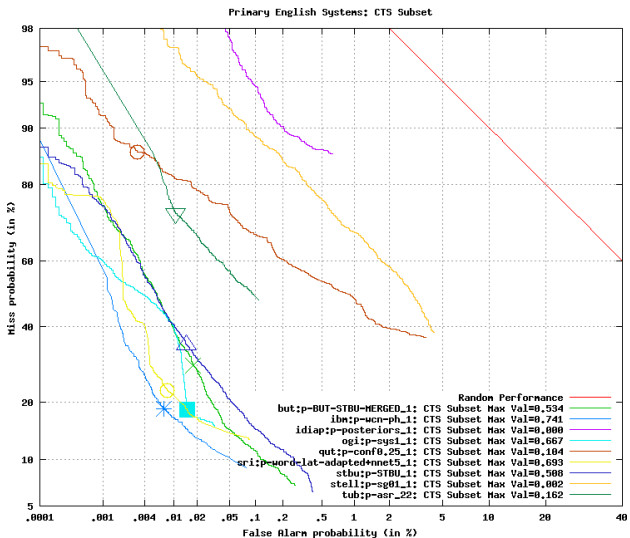
Site	ATWV	MTWV
BUT	0.5235	0.5344
IBM	0.7392	0.7408
IDIAP	-6.1927	0.0000
OGI	0.6470	0.6671
QUT	0.0873	0.1044
SRI	0.6652	0.6934
STBU	0.2152	0.5081
STELL	-0.0002	0.0022
TUB	0.1598	0.1617

ATWV: Actual Term Weighted Value
MTWV: Maximum Term Weighted Value



CTS

DET Curve



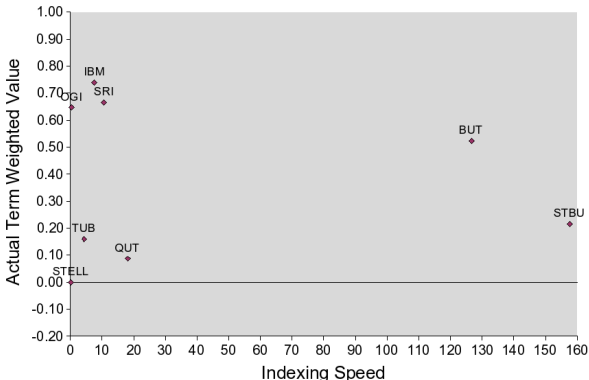
CTS

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Indexing Speed Unit:

Processing Hours per Hours of Speech



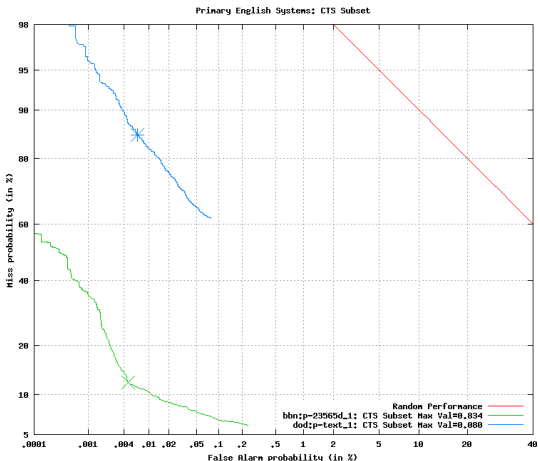
CTS

Single Domain

BBN & DOD

Site	Indexing Speed	ATWV	MTWV
BBN	39.3118	0.8335	0.8336
DOD	14.6992	-0.4070	0.0801

Indexing Speed Unit:
Processing Hours per Hours of Speech

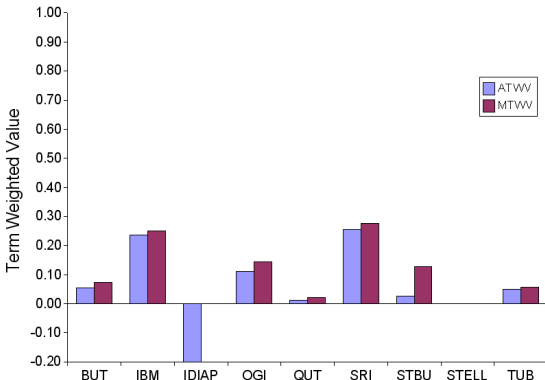


CONFMTG

Actual and Maximum Term Weighted Value

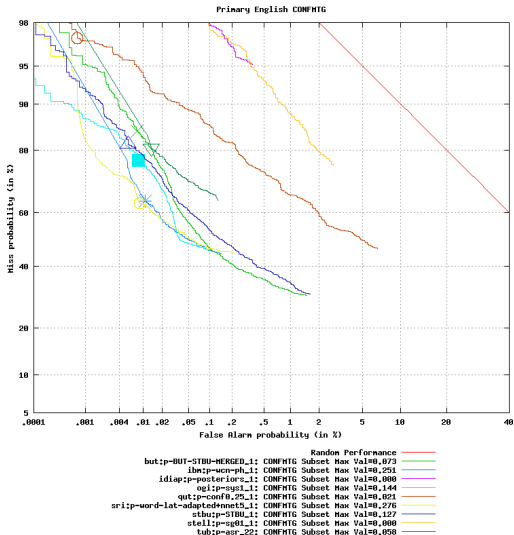
Site	ATWV	MTWV
BUT	0.0549	0.0731
IBM	0.2365	0.2508
IDIAP	-3.6170	0.0000
OGI	0.1103	0.1437
QUT	0.0109	0.0213
SRI	0.2553	0.2765
STBU	0.0253	0.1273
STELL	0.0000	0.0000
TUB	0.0500	0.0578

ATWV: Actual Term Weighted Value
MTWV: Maximum Term Weighted Value



CONFMTG

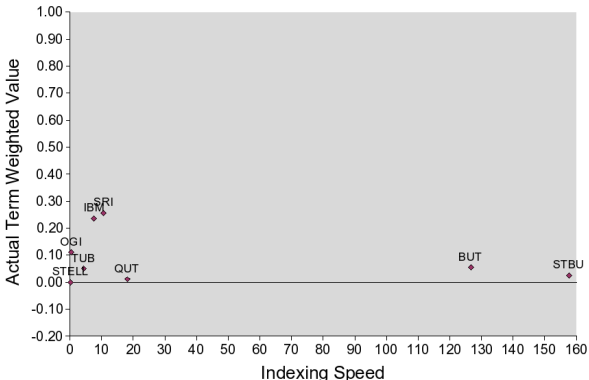
DET Curve



CONFMTG

Indexing Speed vs. ATWV

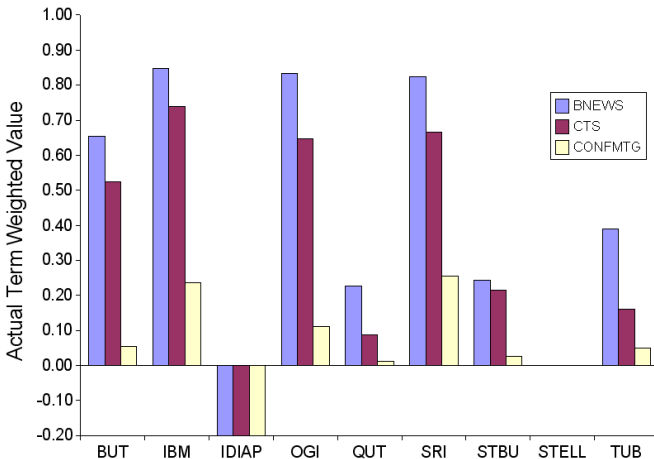
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IDIAP	0.2859	-3.6170
OGI	0.2891	0.1103
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SRI	10.6555	0.2553
STBU	157.6593	0.0253
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Indexing Speed Unit:

Processing Hours per Hours of Speech

Actual Term Weighted Value



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List of Analyses

Term Sub-sets by

- **Number of words**
- **Syllables quantile**
- **Occurrence across domains**
- Characters length quantile
- Average duration of reference occurrence
- Out and In of Vocabulary

Number of words

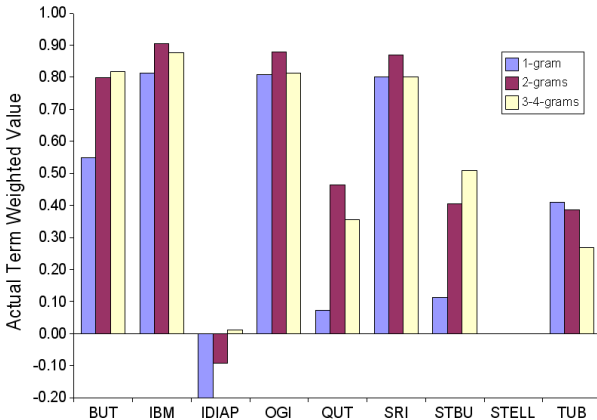
Distribution

Domain	N-Gram	Terms		Occurrences	
		Count	%	Count	%
BNEWS	1-gram	523	58.24	4187	85.57
	2-grams	298	33.18	608	12.43
	3-4-grams	77	8.57	98	2.00
CTS	1-gram	314	76.40	5674	96.89
	2-grams	83	20.20	166	2.83
	3-4-grams	14	3.41	16	0.27
CONFMTG	1-gram	212	87.97	3614	98.42
	2-grams	27	11.20	55	1.50
	3-4-grams	2	0.83	3	0.08

Number of words

BNEWS

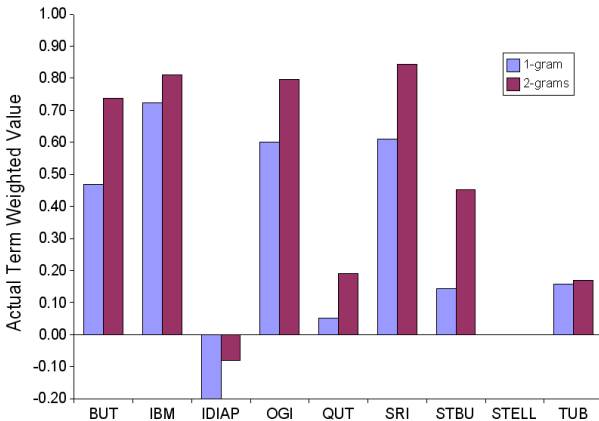
Actual Term Weighted Values



Number of words

CTS

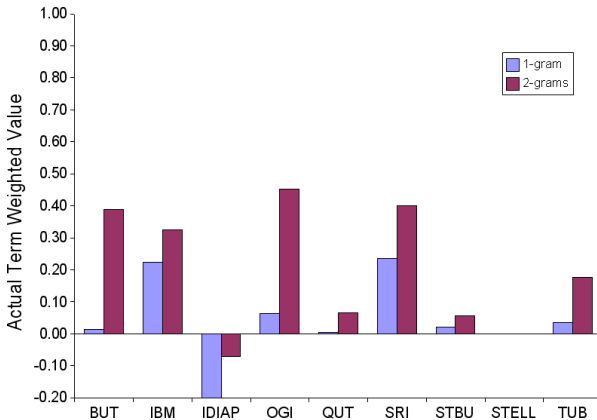
Actual Term Weighted Values



Number of words

CONFMTG

Actual Term Weighted Values



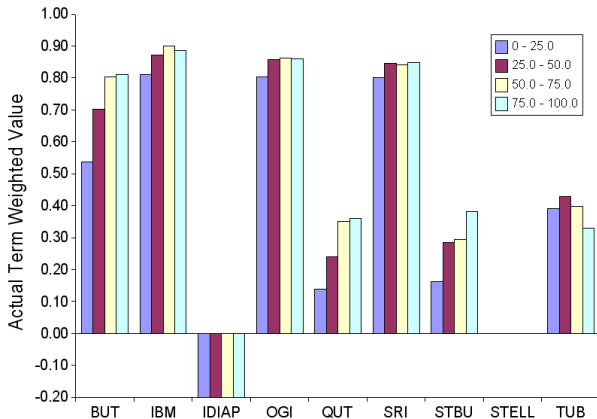
Distribution

Domain	Syllables Quantile	Terms		Occurrences	
		Count	%	Count	%
BNEWS	0 - 25.0	439	48.89	3722	76.07
	25.0 - 50.0	181	20.16	668	13.65
	50.0 - 75.0	116	12.92	295	6.03
	75.0 - 100.0	162	18.04	208	4.25
CTS	0 - 25.0	260	63.26	5392	92.08
	25.0 - 50.0	70	17.03	256	4.37
	50.0 - 75.0	37	9.00	125	2.13
	75.0 - 100.0	44	10.71	83	1.42
CONFMTG	0 - 25.0	178	73.86	3429	93.38
	25.0 - 50.0	33	13.69	162	4.41
	50.0 - 75.0	17	7.05	50	1.36
	75.0 - 100.0	13	5.39	31	0.84

Syllables quantile

BNEWS

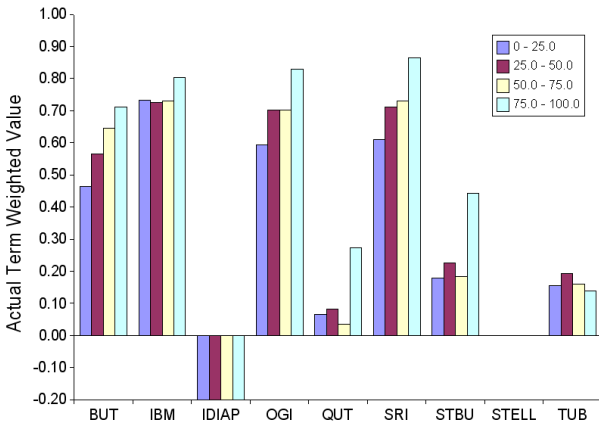
Actual Term Weighted Values



Syllables quantile

CTS

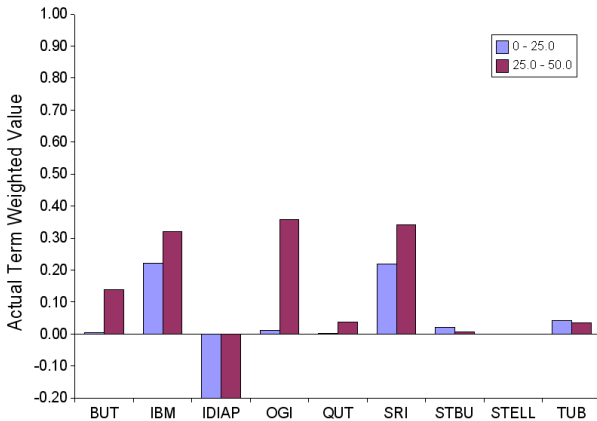
Actual Term Weighted Values



Syllables quantile

CONFMTG

Actual Term Weighted Values

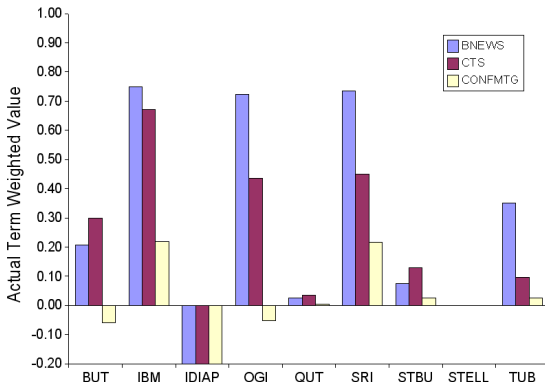


Occurrence across domains

Distribution and ATWV

of Terms: 160

Domain	# Occurrences
BNEWS	2452
CTS	5096
CONFMTG	3433



Summary

Highest Value Scores

- For all domains: OGI, IBM, and SRI
- For CTS: BBN

Results

- Longer terms appear to improve performance
- Domains influence on values: BNEWS > CTS > CONFMTG
 - This could be from: acoustics, spontaneity, etc.

Future Improvements

- Term coverage by domain suggests that the term selection strategy may be improved
- Further analyses on speed measurements
- Composite metric that includes speed & accuracy

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