

Generating Multiple Perspectives in Baseball Summaries by Content Planning

July 2008 ♦ Alice Oh ♦ aoh@mit.edu



Manufacturing index stronger than expected

Index of purchasing managers rose surprisingly in May, but still signaled contraction in the sector.

By Catherine Clifford, CNNMoney.com staff writer
Last Updated: June 2, 2008: 12:09 PM EDT

NEW YORK (CNNMoney.com) -- A key index of manufacturing rose in May, surprising economists, but the purchasing managers' report issued Monday indicated a fourth straight month of sector contraction.

The Institute for Supply Management's (ISM) manufacturing index rose to 49.6 in the month of May, up from the April reading of 48.6. Economists were expecting a reading of 48, according to a consensus estimate compiled by Briefing.com.

The tipping point for the index is 50, with a reading below that reflecting contraction in the sector.

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Stagflation redux



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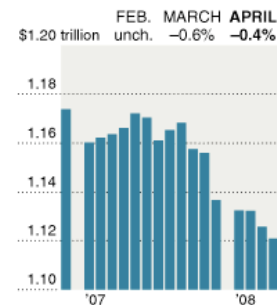
U.S. Manufacturing Sector Contracted in May

By REUTERS
Published: June 2, 2008

Filed at 1:38 p.m. ET

REUTERS Construction Spending

Total construction spending at a seasonally adjusted annual pace.



Source: Commerce Department
The New York Times

NEW YORK (Reuters) - Manufacturing contracted in May for the fourth consecutive month and inflation pressures surged to their highest in four years, heightening fears the world's largest economy could be sliding toward stagflation.

Combined with data on inflation, the report fueled concerns about rising prices in a weak economy, especially after the price of oil hit a record high last month above \$135 a barrel.

The [Institute for Supply Management](#) said its index of national factory activity rose in May, to 49.6 from April's 48.6, slightly above market expectations. But it remained below the level of 50 that signals contraction.

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Politics



washingtonpost.com

White House slams climate bill

Reuters
Monday, June 2, 2008; 11:44 AM

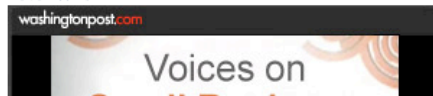
WASHINGTON (Reuters) - The White House on Monday slammed legislation the U.S. Senate will consider this week aimed at controlling climate change, arguing it would cut economic growth and lead to soaring gasoline prices.

"As you can imagine, our opposition to this will be quite strong and we'll be making these points throughout the week," Keith Hennessey, director of President George W. Bush's National Economic Council, said at a White House forum on the economy and taxes.

U.S. gross domestic product could be reduced by as much as 7 percent in the year 2050 and gasoline prices -- already at record highs in the United States-- could soar by as much as 53 cents a gallon by 2030, he said.

The legislation the Senate will debate, which is not expected to become law this year amid a presidential election, could cut total U.S. global warming emissions by 66 percent by 2050, according to a summary of the measure.

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U.S. greenhouse gas emissions would drop by about 2 percent per year between 2012 and 2050, based on 2005 emission levels, under the measure.

The Washington Times

Bush weighs in against climate bill

H. JOSEF HEBERT
Originally published 12:45 p.m., June 2, 2008, updated 12:45 p.m., June 2, 2008

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WASHINGTON (AP) - President Bush weighed in Monday against a Senate bill that would require dramatic cuts in climate-changing greenhouse pollution, cautioning senators "to be very careful about running up enormous costs for future generations of Americans."

The Senate climate bill expected to be debated much of this week would cut emissions of carbon dioxide from burning fossil fuels and other greenhouse gases by about 70 percent over the next four decades. The bill targets power plants, refineries, factories and transportation.

Supporters argue that the shift away from fossil fuels can be made without significant economic damage and that failure to address global warming itself would produce greater economic harm later this century.

Sports



boston.com

CELTICS 89, PISTONS 81

Final blow

Celtics deliver knockout, move on to face Lakers

By Marc J. Spears, Globe Staff | May 31, 2008

AUBURN HILLS, Mich. - After being dead for years, the Celtics-Lakers rivalry finally came back to life last night.

The Celtics advanced to the NBA Finals by defeating the Detroit Pistons, 89-81, in Game 6 of the Eastern Conference finals at The Palace of Auburn Hills. Boston won its 20th conference crown and will make its first Finals appearance since 1987. The Celtics will play the Western Conference champion Los Angeles Lakers in the Finals for the 11th time, having won eight.

"I'm just happy to be a part of this, man," said Celtics forward Paul Pierce, who scored 12 of his 27 points in the fourth quarter. "It's been a long process. I could write a whole book on my emotions right now. But I'm just happy to be in this position, still with the Boston Celtics.

"It makes me think about a year ago today what I was doing. To be in this position with the same team going to the Finals, it's nothing I can really put into words."

Game 1 of the Finals is Thursday at TD Banknorth Garden. Celtics legend John Havlicek presented the Eastern Conference championship trophy.

Once the final buzzer sounded, Kevin Garnett kissed the basketball, Pierce and coach Doc Rivers hugged, and the rest of the players began celebrating, donning East champion hats and T-shirts.

"It's a good feeling," said Garnett, who scored 16 points. "It's kind of surreal, probably hasn't even hit me yet because we haven't slept in about four days, going on five days now. Going to the Finals. I'm just hoping to get some sleep. But it does feel good."

Said Rivers, "We want to be here, and we're at the exact spot that we thought we would be. But we have some more playing to do."

The Boston Globe

The Detroit News
detnews.com

Saturday, May 31, 2008

Eastern Conference finals: Celtics 89, Pistons 81

Pistons lose series to Celtics

Celtics move on to Finals for first time since 1987

Chris McCosky / The Detroit News

AUBURN HILLS - Eras, more often than not, end badly.

The Boston Celtics danced off The Palace floor Friday - bound for their first NBA Finals since 1987.

"I could write a whole [book](#) on my emotions right now," said Paul Pierce, whose 27 points led the Celtics to an 89-81 victory, sending the Pistons to their third-straight loss in the Eastern Conference finals. "It just feels so good. It's kind of surreal right now. To think back to where we were last year at this time and for me to still be here and going to the Finals, it feels real good."

Advertisement For the Pistons, all the promise and brightness of 2004, which gradually dimmed over the years, might now be out for good.

"It's a tough one to lose," Pistons coach Flip Saunders said. "It's always tough when you don't reach your goals after getting so close to getting there."

In the end, all this collection of basketball players have to show for six brilliant seasons is one title, back in 2004, and then five years of excruciating disappointment.

The Pistons are the first team in the modern era to lose in the conference finals three straight years.

Perspective: Challenges



- What makes a story convey a certain perspective?
- Can we make it a tractable problem?
- Can you model that computationally?
- Can you automatically generate a story with a desired perspective?

Approach



- Narrow problem definition
- Validate problem definition: User study I
- Collect parallel corpus & model domain
- Build reordering algorithm
- Evaluate system : User study II

Ordering Hypothesis



You can induce *multiple perspectives* in event summaries by

- taking a neutral article
- reordering the content of it

Why is Perspective Important?



**BBC
NEWS**

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---<http://news.bbc.co.uk>

Why is Perspective Important?



(35-24)



Sweet Sox-teen

Ian Browne / MLB.com

Manny Ramirez hit his 501st homer in the fourth inning, part of a three-RBI day. Mike Lowell immediately followed with a home run, as the Sox strung together 16 hits. J.D. Drew had a homer and three RBIs, and Bartolo Colon gave up four runs on seven hits in six-plus innings.

[Full story >](#)
[Red Sox Wrap >](#)

More Red Sox Headlines

- [Manny donates memorabilia to Hall](#)
- [Ortiz misses start Sunday](#)

Sox go homer happy against O's

Red Sox 9, Orioles 4

	1	2	3	4	5	6	7	8	9	R	H	E
BOS	0	1	3	3	0	0	2	0	0	9	16	0
BAL	0	1	0	2	0	0	1	0	0	4	10	0

[Full Boxscore](#) | [BOS Stats](#) | [BAL Stats](#) | [Standings thru 6/1/2008](#)



Photos



Series at a Glance


Fri, 5/30
BOS 5, BAL 2


Sat, 5/31
BOS 6, BAL 3

Sun, 6/1
BOS 9, BAL 4

Mon, 6/2
BOS @ BAL



(26-29)



O's arms falter

Pete Kerzel / Special to MLB.com

Brian Burres was knocked around for seven runs and 12 hits in four innings, including two home runs, as the O's dropped their third straight to the Sox. Luke Scott helped create three runs, hitting a two-run homer in the fourth, and scoring on Adam Jones' single in the second.

[Full story >](#)
[Orioles Wrap >](#)

More Orioles Headlines

- [Bradford terse about Manny's 500th Tuesday's starter a puzzle for Orioles](#)

Outline



1. Parallel Corpus & Domain Model
2. Content Planning
3. User Study I
4. Reordering Algorithm
5. User Study II

Baseball Domain



	New York Yankees at Boston Red Sox																																								
1	<table border="1" style="margin: auto;"> <thead> <tr> <th></th> <th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th> <th>R</th><th>H</th><th>E</th> </tr> </thead> <tbody> <tr> <td>NY Yankees (3-4)</td> <td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>1</td><td>6</td><td>1</td> </tr> <tr> <td>Boston Red Sox (3-4)</td> <td>0</td><td>2</td><td>2</td><td>3</td><td>0</td><td>0</td><td>0</td><td>1</td><td>X</td> <td>8</td><td>9</td><td>1</td> </tr> </tbody> </table> <p>Final</p>		1	2	3	4	5	6	7	8	9	R	H	E	NY Yankees (3-4)	0	0	0	1	0	0	0	0	0	1	6	1	Boston Red Sox (3-4)	0	2	2	3	0	0	0	1	X	8	9	1	8
	1	2	3	4	5	6	7	8	9	R	H	E																													
NY Yankees (3-4)	0	0	0	1	0	0	0	0	0	1	6	1																													
Boston Red Sox (3-4)	0	2	2	3	0	0	0	1	X	8	9	1																													
W: T. Wakefield (1-0) L: M. Mussina (0-1)																																									
Recap Play-by-Play Box Score Photos																																									

View: [Play-by-Play](#) | [Pitch-By-Pitch](#)

New York - Top of 1st		SCORE	
Tim Wakefield pitching for Boston		NY	BOS
Derek Jeter	D Jeter grounded out to pitcher	0	0
Alex Rodriguez	Strike (looking), Ball, Ball, Strike (foul), Strike (swinging), A Rodriguez struck out swinging	0	0
Gary Sheffield	Strike (looking), Ball, Strike (looking), Ball, Ball, Ball, G Sheffield walked	0	0
Hideki Matsui	Ball, Strike (looking), Strike (foul), Strike (swinging), H Matsui struck out swinging	0	0
End of Inning - 0 Runs, 0 Hits, 0 Errors		0	0
Boston - Bottom of 1st		SCORE	
Mike Mussina pitching for New York		NY	BOS
Johnny Damon	Strike (looking), J Damon singled to right center	0	0
Trot Nixon	Strike (looking), Ball, Strike (swinging), T Nixon flied out to center	0	0
Manny Ramirez	Strike (looking), Ball, Ball, Strike (foul), Ball, Foul, Strike (swinging), M Ramirez struck out swinging, J Damon stole second	0	0
David Ortiz	Ball, Ball, Strike (looking), Ball, D Ortiz flied out to left	0	0
End of Inning - 0 Runs, 1 Hits, 0 Errors		0	0
New York - Top of 2nd		SCORE	
Tim Wakefield pitching for Boston		NY	BOS
Tino Martinez	Ball, Strike (looking), Ball, Strike (foul), Foul, T Martinez flied out to center	0	0
Jorge Posada	Strike (looking), Strike (looking), J Posada grounded out to first	0	0
Jason Giambi	Strike (looking), Ball, Strike (foul), Ball, Strike (swinging), J Giambi struck out swinging	0	0

Baseball Domain



boston.com

RED SOX 8, YANKEES 1

Flying high

Sox raise banner, beat Yankees

By Chris Snow, Globe Staff | April 12, 2005

All this day lacked was Neil Diamond himself, singing and yielding to the crowd. "It's better than my wedding ring," mused Johnny Damon. "You can always have a ring, but you can't have a World Series banner. It's a great feeling."

Bill Russell, who hadn't set foot in the old yard in four decades, walked in the same fashion as Bobby Orr, Richard Seymour, and Tedy Bruschi, the latter of whom was in the class of their manager and uniform, stood atop the visiting dugout to watch the Sox and having to conjure recollections of this day from a television clip.

Johnny Pesky was in his spikes once again, walking onto the redone Fenway Park in the class of their manager and uniform, stood atop the visiting dugout to watch the Sox and having to conjure recollections of this day from a television clip.

They were all here to see a World Series banner tumble over, and concurred that it was a great feeling. "It's better than my wedding ring," mused Johnny Damon. "You can always have a ring, but you can't have a World Series banner. It's a great feeling."

After the hype there was baseball to be played, and the Sox put together a performance that was as good as any they have ever had. They beat the Yankees in the 94th Fenway opener.

The game was decided by the performances of the most alluring characters in the game. Rodriguez, the longest-tenured Sox player (April 26, 1995), worked seven clinical innings in the fourth, when Rodriguez scored on an Edgar Renteria me

But the error of note belonged to Rodriguez, who said he was "overaggr

The New York Times

RED SOX 8, YANKEES 1

With Rings and Then a Rout, It's a Great Day for the Red Sox

By [TYLER KEPNER](#)

Published: April 12, 2005

BOSTON, April 11 - The Yankees have never debated the merits of their own Sox' achievement. To the Yankees, there was nothing cheap or fluffy about the Sox stormed back to beat them in the playoffs last fall, then charged through the World Series.

"You're probably a little jealous," Yankees shortstop Derek Jeter said. "You have respect for what they accomplished, and you know how difficult it was for them to win."

So on a crisp afternoon when they could have been in their clubhouse, the Yankees found no shame in witnessing the celebration of a rival. As the Red Sox gave out 45 World Series rings before their Fenway Park opener on Monday, the Yankees watched from the third-base dugout, even clapping

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Domain Model: Game Events



Boston - Top of 4th		SCORE	
Anibal Sanchez pitching for Florida		BOS	FLA
Coco Crisp	Ball, Strike (looking), Ball, Strike (looking), C Crisp grounded out to pitcher	4	1
Alex Cora	Ball, Ball, Strike (looking), Ball, Strike (looking), Ball, A Cora walked	4	1
David Ortiz	Ball, Strike (looking), D Ortiz homered to right, A Cora scored	6	1
Manny Ramirez	Ball, Strike (swinging), Ball, Strike (looking), Ball, Strike (swinging), M Ramirez struck out swinging	6	1
Trot Nixon	T Nixon reached on infield single to second	6	1
Mike Lowell	Strike (looking), Strike (foul), Foul, Ball, T Nixon to second on wild pitch by A Sanchez, M Lowell doubled to deep left, T Nixon scored	7	1

batter	pitcher	play	inn	atbat	s	b	h	v	1st	r	o
crisp	sanchez	grndout	4	18	2	2	4	1	none	0	0
cora	sanchez	walk	4	19	2	4	4	1	none	0	1
ortiz	sanchez	homerun	4	20	1	1	4	1	cora	2	1
ramirez	sanchez	strkout	4	21	3	3	6	1	none	0	1
nixon	sanchez	single	4	22	0	0	6	1	none	0	2
lowell	sanchez	double	4	23	2	1	6	1	nixon	1	2

Corpus



- Game logs on mlb.com (360 games)
- Summary articles from
 - AP (espn.com)
 - <http://www.mlb.com> (2 articles per game)
 - Boston Globe
 - New York Times
 - Washington Post
 - Toronto Star
 - Tampa Bay Tribune

Alignment



Boston - Top of 3rd	
Anibal Sanchez pitching for Florida	
David Ortiz	Ball, Ball, D Ortiz homered to center
Manny Ramirez	Ball, Strike (looking), Ball, Strike (looking)

ortiz	sanchez	homerun	3	13	0	2	2	1
crisp	sanchez	grndout	4	18	2	2	4	1
ortiz	sanchez	homerun	4	20	1	1	4	1
ramirez	sanchez	strkout	4	21	3	3	6	1
nixon	sanchez	single	4	22	0	0	6	1
lowell	sanchez	double	4	23	2	1	6	1

Ortiz made his presence felt with a solo shot to center in the third that just seemed to keep carrying.

An inning later, Ortiz was back for more, unloading on a Sanchez offering for a two-run blast to right.

Lowell, looking comfortable in his old haunts, ripped a double high off the wall in left later in the inning to make it a 7-1 lead for the Sox.

Boston - Top of 4th		SCORE	
Anibal Sanchez pitching for Florida		BOS	FLA
Coco Crisp	Ball, Strike (looking), Ball, Strike (looking), C Crisp grounded out to pitcher	4	1
Alex Cora	Ball, Ball, Strike (looking), Ball, Strike (looking), Ball, A Cora walked	4	1
David Ortiz	Ball, Strike (looking), D Ortiz homered to right, A Cora scored	6	1
Manny Ramirez	Ball, Strike (swinging), Ball, Strike (looking), Ball, Strike (swinging), M Ramirez struck out swinging	6	1
Trot Nixon	T Nixon reached on infield single to second	6	1
Mike Lowell	Strike (looking), Strike (foul), Foul, Ball, T Nixon to second on wild pitch by A Sanchez, M Lowell doubled to deep left, T Nixon scored	7	1

Outline



1. Parallel Corpus & Domain Model
2. Content Planning
3. User Study I
4. Reordering Algorithm
5. User Study II

Steps in NLG



- Content Selection
 - ▣ which feature vectors to include
- Content Planning
 - ▣ how the feature vectors are grouped and ordered
- Surface Realization
 - ▣ how the feature vectors are written as sentences

Steps in NLG



- Content Selection
 - AP content
- **Content Planning**
 - **regrouping and reordering algorithm**
- Surface Realization
 - templates

Content Planning



batter	pitcher	play	inn	atbat	h	v	1st	r	o
ramirez	sanchez	homerun	1	3	0	0	cora	3	1
ortiz	sanchez	homerun	3	14	3	1	none	1	0
ortiz	sanchez	homerun	4	20	4	1	cora	2	1
lowell	sanchez	double	4	23	6	1	nixon	1	2
ortiz	sanchez	double	6	47	7	1	cora	1	0
ramirez	sanchez	homerun	6	48	8	1	ortiz	2	0

Ramirez had a three-run homer in an eventful first inning, then added a two-run shot in the sixth.

Ortiz had a solo homer in the third, a two-run homer in the fourth and narrowly missed another in the sixth, settling for a long RBI double off the left-field scoreboard.

Former Marlin Mike Lowell tied a career high with three doubles including an RBI double in the 3-run fourth.

Content Planning



batter	pitcher	play	inn	atbat	h	v	1st	r	o
ramirez	sanchez	homerun	1	3	0	0	cora	3	1
ramirez	sanchez	homerun	6	48	8	1	ortiz	2	0
ortiz	sanchez	homerun	3	14	3	1	none	1	0
ortiz	sanchez	homerun	4	20	4	1	cora	2	1
ortiz	sanchez	double	6	47	7	1	cora	1	0
lowell	sanchez	double	4	23	6	1	nixon	1	2

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Former Marlin Mike Lowell tied a career high with three doubles including an RBI double in the 3-run fourth.

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User Study I: Purpose



- AP articles and local articles overlap 73% of content
- Can we ignore the rest?
- Is content planning enough?

User Study I: Methodology



- Subjects: 8 MIT students
- Format: online survey
- Question: “Do you think this article was written for the fans of Team A or Team B?”
- Articles:
 - 1 AP (neutral)
 - 2 mlb.com local articles
- 4 games, 12 articles

User Study I: Input



- Original articles
- Modification 1: Aligned Content
 - Include game event aligned content
 - Throw out commentary, global trends
- Modification 2: AP Content
 - Include content overlapping with AP
 - Throw out all other game events
 - Replace sentences with templates

User Study I: Results



Subjects' ratings for each summary on a scale from 1 to 5, where 1 means the summary has been written for Team A, and 5 for Team B. ($n = 8$)

Game 1	Team A	AP	Team B
Original	1.38	3.5	4.63
Aligned Content	1.50	3.25	4.38
AP Content	1.75	3.13	4.00
Game 2	Team A	AP	Team B
Original	2.25	2.75	3.75
Aligned Content	2.38	3.63	3.88
AP Content	2.5	3.38	3.63
Game 3	Team A	AP	Team B
Original	4.25	4.38	4.63
Aligned Content	4.38	4.75	4.75
AP Content	4.88	4.75	4.75

User Study I: Results



- User study reveals leaving out non-overlapping content retains most of the perspective
- Content grouping and ordering contributes significantly to the document's perspective

Outline



1. Parallel Corpus & Domain Model
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System Overview



- Start with AP content
 - Content selection simplified
 - Completeness & accuracy of article preserved
- Regroup content according to shared features
- Reorder groups according to
 - Feature weights
 - Chronological order
- Use templates

System Overview



Ortiz made his presence felt with a solo shot to center in the third that just seemed to keep carrying.

An inning later, Ortiz was back for more, unloading on a Sanchez offering for a two-run blast to right.

Lowell, looking comfortable in his old haunts, ripped a double high off the wall in left later in the inning to make it a 7-1 lead for the Sox.

Ortiz hit a one-run homerun in the third inning. Then, Lowell hit an RBI double in the fourth. Nixon hit a single, and Ortiz hit a 2-run homerun.



ortiz	sanchez	homerun	3	13	2	2
crisp	sanchez	grndout	4	18	2	4
ortiz	sanchez	homerun	4	20	1	4
ramirez	sanchez	strkout	4	21	3	6
nixon	sanchez	single	4	22	0	6
lowell	sanchez	double	4	23	1	6



ortiz	sanchez	homerun	3	13	2	2
lowell	sanchez	double	4	23	1	6
nixon	sanchez	single	4	22	0	6
ortiz	sanchez	homerun	4	20	1	4

Player as Grouping Feature



Glaus came a few feet shy of having three home runs in the sixth inning, when he sent another pitch from Bedard off the wall in left-center field. He later scored when Shea Hillenbrand chipped in an RBI single. Glaus added a ground-rule double in the ninth, and finished the day with four RBIs.

RBI as Grouping Feature



Aside from Sexson's home run in the sixth, Johjima -- who had the first three-hit game of his career -- had an RBI double in the inning. Betancourt bounced a two-run double into left field and Jose Lopez later added an RBI triple.

Features for Grouping



batter	pitcher	play	inn	atbat	1st	r	o
ramirez	sanchez	homerun	1	3	cora	1	1
ramirez	sanchez	homerun	6	48	ortiz	1	0
ortiz	sanchez	homerun	3	14	none	1	0
ortiz	sanchez	homerun	4	20	cora	1	1
ortiz	sanchez	double	6	47	cora	1	0
varitek	sanchez	foulout	4	21	none	0	1
nixon	sanchez	single	4	22	none	0	2
lowell	sanchez	double	4	23	nixon	1	2

- Use aligned corpus to identify features that group the feature vectors together
- Assign weights to features according to frequency in corpus

Features for Grouping



batter	pitcher	play	inn	r
ramirez	sanchez	homerun	1	1
ramirez	sanchez	homerun	6	1
ortiz	sanchez	homerun	3	1
ortiz	sanchez	homerun	4	1
ortiz	sanchez	double	6	1
varitek	sanchez	foulout	4	0
nixon	sanchez	single	4	0
lowell	sanchez	double	4	1

batter	pitcher	play	inn	r
ramirez	sanchez	homerun	1	1
ortiz	sanchez	homerun	3	1
varitek	sanchez	foulout	4	0
nixon	sanchez	single	4	0
lowell	sanchez	double	4	1
ortiz	sanchez	homerun	4	1
ramirez	sanchez	homerun	6	1
ortiz	sanchez	double	6	1

- For each group
 - Compute the score $w_f n$
 - w_f is weight computed for feature f that is shared by all the vectors in a group
 - n is the number of feature vectors in that group
 - Do this for all features shared by the feature vectors in the group



- More on feature weight learning

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User Study



- 5 games, 4 articles each
- 15 Users
- Online Evaluation
- Articles
 - ▣ Baseline: content ordered chronologically
 - ▣ Modified AP: aligned content, sentences replaced with templates
 - ▣ Home & Away: system-generated output

Game 3



TGlaus (TOR) had 3 homeruns in the game.
In the first inning, he hit a 2-run homerun.
In the seventh inning, he hit a 1-run homerun.

ARios (TOR) had 4 RBIs.
In the first inning, he hit a 1-run double.
In the second inning, he hit a 2-run homerun.
In the sixth inning, he hit a 1-run sacrifice.

New York scored 4 runs in the first inning.
First, DJeter (NYY) hit a triple.
Then, GSheffield (NYY) hit a 1-run single.
Then, ARodriguez (NYY) hit a 2-run homerun.
Then, JGiambi (NYY) hit a 1-run homerun.

New York had 2 homeruns in the first inning.
ARodriguez(NYY) hit a 2-run homerun.
And, JGiambi(NYY) hit a 1-run homerun.

Toronto had 3 homeruns in the game.
In the first inning, TGlaus(TOR) hit a 2-run homerun.
In the second inning, ARios(TOR) hit a 2-run homerun.
In the seventh inning, TGlaus(TOR) hit a 1-run homerun.

New York scored 1 more runs in the first inning.
DJeter(NYY) hit a triple.
Then, GSheffield(NYY) hit a 1-run single.

Results



Subjects' ratings for each summary on a scale from 1 to 5, where 1 means the summary has been written for Team A, and 5 for Team B. ($n = 15$)

	Game 1	Game 2	Game 3	Game 4	Game 5
Home	2.75	2.38	2.73	3.50	2.00
AP	3.64	3.86	3.63	3.27	2.75
Away	3.88	4.27	4.25	3.63	3.93
Chron	3.40	4.13	3.29	3.38	2.29

ANOVA shows significantly different perspective ratings for 4 out of 5 games

Results: Pairwise Comparisons



G1	H	AP	A	C
H		0.03	0.02	0.09
AP			0.45	0.39
A				0.13

G2	H	AP	A	C
H		0.01	0.00	0.02
AP			0.12	0.49
A				0.67

G3	H	AP	A	C
H		0.02	0.00	0.14
AP			0.06	0.41
A				0.03

G4	H	AP	A	C
H		0.15	0.00	0.39
AP			0.03	0.31
A				0.00

Add animation and/or caption here to explain different colors

Contributions



- Identified content ordering as an important sub-problem for studying perspective
- Validated the ordering hypothesis through web-based study with 8 users
- Collected and analyzed corpus of 360 games and corresponding perspective articles
- Implemented ordering algorithm that injects perspective into neutral articles
- Verified significantly different perspectives in system output through user study for 5 games, 20 summaries, with 15 users

Future Plans



- Publish corpus of game data & summary articles
 - Share corpora?
- Try a different domain (politics? finance?)
 - Share understanding of domains?
- Add a different modality
 - Share expertise on multimedia?