Appendix D

User Evaluations of Recommender Systems

Section 5.1 described the recommender system experiment. This appendix contains the user ratings that were not included there. The summary of the scores is repeated in table D.1, augmented with page numbers for the detailed ratings.

D.1   American Airlines

The URLs returned by each system for the "American Airlines" home page are shown in Table D.2. All 5 sites returned by Excite were within the American web site, leading to low ratings for novelty. Of the 5 sites returned by ParaSite, only one was at the American web site, three were to other travel-related pages, and one was to an entirely irrelevant page. The Excite pages were rated as being slightly more relevant, while the ParaSite pages were judged more interesting and slightly more novel. The user ratings are shown in Table D.3.

D.2   Geodesic Systems

The URLs returned by each system for the "Geodesic Systems" home page are shown in Table D.4. Geodesic Systems is a company that makes a C++ garbage collector. The results were similar to those for American Airlines: All of the Excite recommendations were within the same site as the seed URL, leading to low ratings for novelty. Of the 4 sites returned by ParaSite, only one was within the seed site, and three were to other software development pages. A representative comment was:

> If you're specifically interested in Geodesic then I would prefer system A [Excite]. If you're interested in tools which I think more people are then system B [ParaSite] would be better. —W

Correspondingly, the ParaSite pages were rated as being slightly more relevant and interesting and much more novel, as shown in Table D.5.

D.3   Rogue Market

The URLs returned by each system for the "Rogue Market" home page are shown in Table D.6. The Rogue Market is an exchange for virtual shares of celebrities and other popular culture icons. Excite's top two suggestions were pages that mentioned the Rogue Market, and the last three pages that contained one or both of the words "rogue" and "market". ParaSite's first suggestion was rated entirely irrelevant, the second was a fan club, and the last three were online gaming sites. As the person who provided the seed URL wrote:

Ebert	Excite	0.95	1.30	0.55	0.92
(p. 79)	ParaSite	1.55	1.35	1.00	3.00
	Δ	63%	4%	82%	225%
Austin	Excite	0.95	0.95	0.25	0.23
(p. 80)	ParaSite	1.40	1.85	1.40	5.84
	Δ	47%	95%	460%	2459%
Mapquest	Excite	2.20	1.85	1.35	6.49
(p. 83)	ParaSite	0.90	1.40	0.78	1.59
	Δ	-59%	-24%	-43%	-76%
American	Excite	1.95	1.60	0.95	3.09
(p. 80)	ParaSite	0.99	1.11	1.45	7.00
	Δ	-49%	-31%	53%	127%
Geodesic	Excite	2.25	1.94	0.44	1.90
(p. 121)	ParaSite	2.31	2.13	1.75	9.13
	Δ	3%	10%	300%	381%
AMD	Excite	1.30	1.35	1.35	4.31
(p. 81)	ParaSite	1.81	1.69	0.88	3.34
	Δ	39%	25%	-35%	-23%
Rogue	Excite	1.30	1.35	1.35	4.31
(p. 122)	ParaSite	1.13	1.37	1.50	4.44
	Δ	-13%	1%	11%	3%
Art Bell	Excite	2.25	2.00	0.50	2.25
(p. 122)	ParaSite	0.6	1.00	0.90	0.85
	Δ	-73%	-50%	80%	-62%
Activision	Excite	1.80	1.45	2.15	5.73
(p. 123)	ParaSite	1.73	2.07	1.65	6.79
	Δ	-4%	43%	-23%	19%
Happy Puppy	Excite	2.63	2.19	1.13	7.15
(p. 124)	ParaSite	1.09	1.14	1.10	3.85
	Δ	-58%	-48%	-2%	-46%
Economist	Excite	1.90	1.70	1.80	6.32
(p. 125)	ParaSite	1.00	1.00	0.75	3.41
	Δ	-47%	-41%	-58%	-46%
Geek	Excite	1.94	1.44	0.94	3.12
(p. 82)	ParaSite	1.71	1.83	2.13	7.12
	Δ	-12%	28%	127%	128%
KnotPlot	Excite	2.45	2.05	1.85	9.95
(p. 84)	ParaSite	1.30	1.05	1.87	3.13
	Δ	-47%	-49%	1%	-69%
Average	Excite	1.84	1.63	1.12	4.29
	ParaSite	1.35	1.46	1.32	4.58
	Δ	-27%	-10%	17%	7%

Table D.1: Averages of Ratings by Seed URL. Ratings were from 0 to 3, with higher numbers better. Seed URLs are listed in Table 5.2 on page 76.

Excite	ParaSite
aa_home/aadvantage/guide/earn.htm	www.microsoft.com/
Earning AAdvantage Miles	*Microsoft Corporation Home Page*
aa_home/somespec.htm	www.ual.com/
Something Specials	*United Airlines Official Homepage*
aa_home/aadvantage/aadvantage.htm	itre.ncsu.edu/index.html
AAdvantage Home Page	*The ITRE Home Page*
aa_home/aadvantage/guide/platinum.htm	www.americanair.com/
AAdvantage Member Guide - Platinum Members	*American Airlines Home Page*
aa_home/aavac/aav_info/info2.html	www.easysabre.com/
Fly AAway Vacations Hotel Ratings	*easySABRE*

Table D.2: Top 5 Pages Returned by Excite and ParaSite for American Airlines URL (http://www.americanair.com:80/aa_home.htm). The host name, "www.americanair.com" is omitted from the Excite URLs above.

P	K	W	S	Title	Average			prod-
r i n	r i n	r i n	r i n		r	i	n	uct
3 3 1	1 1 1	3 3 1	2 0 0	Earning Aadvantage Miles	2.25	1.75	0.75	2.95
3 3 2	1 1 1	3 3 2	2 0 0	Something Specials	2.25	1.75	1.25	4.92
3 3 1	1 1 1	3 3 1	1 0 0	Aadvantage Home Page	2	1.75	0.75	2.63
2 1 1	1 1 1	2 2 1	1 0 0	Aadvantage Member Guide...	1.5	1	0.75	1.13
2 3 2	1 1 1	3 3 2	1 0 0	FlyAAway Vacations...	1.75	1.75	1.25	3.83
				Excite averages	1.95	1.60	0.95	3.09
0 1 1	0 0 0	0 1 1	0 2 1	Microsoft Corporation Home Page	0	1	0	0.00
2 2 1	3 3 1	3 3 1	3 1 2	United Airlines Official Homepage	2.75	2.25	1.25	7.73
1 0 1	0 0 3	2 2 3	0 1 0	The ITRE Home Page	0.75	0.75	1	0.56
3 3 0	3 3 0	3 3 1	1 0 0	American Airlines Home Page	2.5	2.25	0.25	1.41
3 3 2	2 2 3	3 3 1	3 3 3	easySABRE	2.75	2.75	2.25	17.02
				ParaSite averages	1.75	1.80	0.95	5.34

Table D.3: User Ratings of American Airlines Recommendations

Excite	ParaSite
www.geodesic.com/news/news_hp-ux.html	www.geodesic.com/GreatCircle/index.html
Geodesic: Great Circle for HP-UX press release	*Geodesic - Great Circle*
www.microway.com.au/catalog/geodesic /welcome.html	www.parasoft.com/
Geodesic Systems Welcome Page	*ParaSoft Corporation*
www.geodesic.com/comments/comments.html	www.pureatria.com/
Geodesic Systems- Comments	*Pure Atria*
www.geodesic.com/GreatCircle/index.html	www.roguewave.com/
Geodesic - Great Circle	*Rogue Wave Home Page*

Table D.4: Top 4 Pages Returned by Excite and ParaSite for Geodesic Systems URL (http://www.geodesic.com). Because ParaSite could only generate 4 suggestions, only the top 4 suggestions from Excite were used.

P r i n	K r i n	W r i n	S r i n	Title	Average			prod- uct
					r	i	n	
3 3 0	2 2 0	3 2 2	1 0 0	GS: Great Circle for HP-UX...	2.25	1.75	0.5	1.97
3 3 0	2 2 0	3 3 2	1 0 0	GS Welcome Page	2.25	2	0.5	2.25
3 3 0	2 2 0	3 3 1	1 0 0	GS - Comments	2.25	2	0.25	1.13
3 3 0	2 2 0	3 3 2	1 0 0	Geodesic - Great Circle	2.25	2	0.5	2.25
					2.25	1.94	0.44	1.90
3 3 0	2 2 0	3 3 2	1 0 0	Geodesic - Great Circle	2.25	2	0.5	2.25
3 3 3	3 2 3	3 3 2	3 2 1	ParaSoft Corporation	3	2.5	2.25	16.88
3 3 2	2 2 3	1 1 1	2 1 1	Pure Atria	2	1.75	1.75	6.13
2 2 3	2 2 3	3 3 3	1 2 1	Rogue Wave Home Page	2	2.25	2.5	11.25
				ParaSite averages	2.31	2.13	1.75	9.13

Table D.5: User Ratings of Geodesic Systems Recommendations. For display purposes, the company name has been abbreviated to "GS".

Excite	ParaSite
www.stonesworld.com/2.0/corner/bbs/messages/ 12179.html *Stones Stock at 91.51 in the Rogue Market*	earth.simmons.edu/ *EnviroNet at Simmons College*
newsradio88.com/boot/archive/july_1997/july_17.html *WCBS NEWSRADIO 88 Boot Camp*	op.net/~jester *The Proudest Monkeys:* *The Dave Matthews Band Fan Club*
www.fool.com/FoolFAQ/FoolFAQ0007.htm *The Motley Fool:* *Fool FAQ - Bid/Ask Price*	smc.sierra.com/ *Sierra Internet Gaming System*
rogue.northwest.com/ mushro19/ *Mushrooms, Truffles &* *Matsutakes of the Northwest*	www.eonline.com/ *Welcome to E! Online - Front Door*
swerve.basilisk.com/basilisk_381.html *basilisk*	www.mindspring.com/~ogl/pcbt.htm *Puzzle, Card, Etc, Online Games*

Table D.6: Top 4 Pages Returned by Excite and ParaSite for Rogue Market Seed URL (http://www.roguemarket.com)

> System A [Excite] found me sites that mentioned the Rogue Market. System B [ParaSite] appeared to match what I was doing, having fun on the internet (Sierra, E!, Puzzle), gossip about stars, etc. —K

As shown in Table D.7, the two systems received similar numeric ratings, with the Excite pages judged more relevant and the ParaSite pages more novel.

D.4   Art Bell

The URLs returned by each system for the "Art Bell" web site are shown in Table D.8. Art Bell is a talk radio host who covers fringe topics. All 5 of Excite's recommendations were pages within the Art Bell site. None of the ParaSite suggestions were on the same site, and only one was relevant. Excite scored higher on relevance and interest, while ParaSite scored higher on novelty D.9.

| P | K | W | S | Title | Average | | | prod- |
r i n	r i n	r i n	r i n		r	i	n	uct
3 2 1	2 0 3	3 3 2	2 1 0	Stones Stock	2.5	1.5	1.5	5.63
3 3 3	0 0 3	3 2 3	2 2 1	WCBS NEWSRADIO 88	2	1.75	1.75	6.13
1 2 3	1 0 3	3 3 2	2 3 3	The Motley Fool	1.75	2	2.75	9.63
0 1 3	0 0 3	0 0 2	0 1 0	Mushrooms, Truffles	0	0.5	0	0.00
1 2 3	0 0 3	0 0 2	0 2 2	basilisk	0.25	1	0.75	0.19
				Excite averages	1.30	1.35	1.35	4.31
0 1 0	0 0 3	0 1 2	0 1 1	EnviroNet	0	0.75	0	0.00
0 0 0	1 0 3	0 0 2	1 1 1	The Proudest Monkeys	0.5	0.25	1	0.13
3 3 3	0 0 1	2 2 2	2 1 2	Sierra Internet Gaming	1.75	1.5	1.75	4.59
2 3 3	2 2 2	1 2 3	- - -	Welcome to E! Online	1.67	2.33	2.25	8.75
3 3 3	1 2 3	2 2 2	1 1 2	Puzzle, Card, Etc.	1.75	2	2.5	8.75
				ParaSite averages	1.13	1.37	1.50	4.44

Table D.7: User Ratings of Rogue Market Recommendations

Excite	ParaSite
www.artbell.com/satellite.html	www.yahoo.com/
Art Bell - Satellite Reception Info	Yahoo!
www.artbell.com/canvas.html	www.afrosquad.com/
Art Bell - The Artist's Canvas	AfroFrontDoor
www.artbell.com/stations.html	www.bigbook.com/
Art Bell - Radio Station Affiliates	BigBook
www.artbell.com/ufos2.html	www.execpc.com/~krstic/mylinks.html
Art Bell - UFO Photos Page 2	Rick Krsticevic's Links
www.artbell.com/hotlinks.html	www.four11.com/
Art Bell - Related Web Links	Four11 Directory Services

Table D.8: Top 5 Pages Returned by Excite and ParaSite for Art Bell Seed URL (http://www.artbell.com).

| P | K | W | S | Title | Average | | | prod- |
r i n	r i n	r i n	r i n		r	i	n	uct
3 3 0	2 2 0	3 3 1	1 0 0	Art Bell - Satellite Reception Info	2.25	2	0.25	1.13
3 3 0	2 2 0	3 3 2	1 0 0	Art Bell - The Artist's Canvas	2.25	2	0.5	2.25
3 3 0	2 2 0	3 3 2	1 0 0	Art Bell - Radio Station Affiliates	2.25	2	0.5	2.25
3 3 0	2 2 0	3 3 2	1 0 0	Art Bell - UFO Photos Page 2	2.25	2	0.5	2.25
3 3 0	2 2 0	3 3 3	1 0 0	Art Bell - Related Web Links	2.25	2	0.75	3.38
				Excite averages	2.25	2.00	0.50	2.25
3 3 0	0 1 0	1 1 0	0 1 1	Untitled	1	1.5	0	0.00
0 0 0	0 1 3	1 1 1	1 1 1	AfroFrontDoor	0.5	0.75	0.5	0.19
1 2 2	0 0 1	1 1 3	0 1 1	BigBook	0.5	1	1.25	0.63
2 3 2	0 0 3	1 1 3	2 2 1	Rick Krsticevic's Links	1.25	1.5	1.5	2.81
1 2 2	0 0 1	1 1 3	0 1 0	Four11 Directory Services	0.5	1	1.25	0.63
				ParaSite averages	0.6	1.00	0.90	0.85

Table D.9: User Ratings of Art Bell Recommendations

Excite	ParaSite
www.connix.com/~bruth/atari.html Entertainment Corner: Atari Cartridges	www.interplay.com/ Interplay Productions
www.primenet.com/~rworne/atari5200.shtml Classic Video Game Collecting	www.microsoft.com/ Microsoft Corporation Home Page
www.pribish.com/atari.list.8b.alphabetical.html Reinhard Pribish's Atari 400/800 Alphabetical List	www.cnet.com/ Welcome to CNET.COM
www.silcom.com/~halling/h-atari.htm Associated Enterprises	www.discovery.com/ Discovery Online
pw1.netcom.com/~kinggus/games/trade.html The Kingdom presents. . . Tradebait!	/www.ea.com/ Electronic Arts Online

Table D.10: Top 5 Pages Returned by Excite and ParaSite for Activision Seed URL (http://www.activision.com). Ellipsis in original.

P r i n	K r i n	W r i n	S r i n	Title	Average			prod- uct
					r	i	n	
3 3 3	1 1 3	3 2 3	1 1 0	Entertainment Corner. . .	2	1.75	2.25	7.88
2 2 3	1 1 3	3 3 3	1 1 1	Classic Video Game Collecting	1.75	1.75	2.5	7.66
2 2 3	1 1 3	3 2 2	1 0 0	Reinhard Pribish's Atari. . . List	1.75	1.25	2	4.38
2 2 3	1 1 3	3 2 2	1 0 0	Associated Enterprises	1.75	1.25	2	4.38
2 2 3	1 1 3	3 2 2	1 0 0	The Kingdom presents. . . Tradebait!	1.75	1.25	2	4.38
				Excite averages	3	2.67	2	16
- - -	3 3 1	3 3 2	3 2 2	Interplay Productions	1.25	1.5	0.75	1.41
0 0 0	3 2 1	2 2 2	0 2 1	Microsoft Corporation Home Page	1.5	2.25	2	6.75
1 3 3	0 0 0	3 3 3	2 3 2	Welcome to CNET.COM	0.67	1.67	2	2.22
1 3 3	0 0 0	1 2 3	- - -	Discovery Online	2.25	2.25	1.5	7.59
3 3 3	3 3 1	0 1 2	3 2 2	Electronic Arts Online				
				ParaSite averages				

Table D.11: User Ratings of Activision recommendations

D.5 Activision

The URLs returned by each system for the "Activision" home page are shown in Table D.10. Activision is a company that makes computer games. Excite returned 5 sites that listed cartridges for Atari games systems. As user S noted: "Activision made games for [Atari] once upon a time. . . the selected sites are very similar to each other but not to the seed url." ParaSite returned the home pages of five different companies, two of which make computer games. Users found the Excite selections slightly more relevant (1.8 vs. 1.73) and significantly more novel (2.15 vs. 2.65), while the ParaSite pages were judged more interesting (2.07 vs. 1.45). As one user summarized:

> System A [Excite] found Atari cartridge links and pages. Not useful. System B [ParaSite] found other gaming pages. I guess the usefulness of these would depend on what you felt like doing. —K

D.6 Happy Puppy

Table D.12 shows the URLs returned by each system for the "Happy Puppy" pages, the self-proclaimed "#1 Game Site on the Internet". Three of the four Excite recommendations were for pages on the same server. The fourth was a review of computer game sites. None of the ParaSite recommendations were on the Happy Puppy server. One was a computer gaming site, and one was a site for downloading shareware software. The two remaining suggestions were largely irrelevant.

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Excite	ParaSite
happypuppy.com/games/kids.htm *Games - Happy Puppy's Kids Area*	hem.passagen.se/famjakob/musik.htm *Untitled*
www.happypuppy.com/cheats/ *Happy Puppy's Cheats Page*	www.gamesdomain.co.uk/ *Games Domain - The world's largest games site*
happypuppy.com/games/w3games.htm *Happy Puppy Games You Play on the WWW*	www.shareware.com/ *SHAREWARE.COM – the way to find* *shareware on the Internet*
netfind.aol.com/aol/Reviews/Hobbies/ Games/Computer/Game_Biz/ index.netfind.html *AOL NetFind: Reviews: Game Biz*	www.usc.edu *USCWeb, the University of Southern California*

Table D.12: Top 4 Pages Returned by Excite and ParaSite for Happy Puppy Seed URL (http://www.happypuppy.com).

P	K	W	S	Title	Average			prod-
r i n	r i n	r i n	r i n		r	i	n	uct
3 3 0	3 0 0	3 3 3	1 1 0	Games - Happy Puppy's Kids Area	2.5	1.75	0.75	3.28
3 3 0	3 2 0	3 3 3	1 1 0	Happy Puppy's Cheats Page	2.5	2.25	0.75	4.22
3 3 0	3 2 0	3 3 3	1 1 0	Happy Puppy Games You Play...	2.5	2.25	0.75	4.22
3 3 3	3 2 2	3 3 3	3 2 1	AOL NetFind: Reviews: Game Biz	3	2.5	2.25	16.88
3 3 2	3 2 3	3 3 3	3 2 1	Games	0	0	0	0.00
				Excite averages	2.63	2.19	1.13	7.15
- - -	0 0 3	0 0 0	0 0 0	Untitled	0	0	0	0.00
3 3 3	3 3 2	3 3 3	3 2 1	Games Domain	3	2.75	2.25	18.56
3 3 3	2 2 1	1 2 2	2 1 1	SHAREWARE.COM	2	2	1.75	7.00
0 3 2	0 0 3	1 1 2	- - -	USCWeb	0.33	1.33	0.5	0.22
				ParaSite averages	1.33	1.52	1.13	6.45

Table D.13: User Ratings of HappyPuppy Recommendations

As Table D.13 shows, the Excite pages were judged more relevant (2.63 vs. 1.33) and interesting (2.19 vs. 1.52) than the ParaSite pages and equally interesting (1.13). As one user wrote:

> System A [Excite] ... came up with 3 references from the original home page. The last [reference looks] good.
> System B [ParaSite] came up with two great references. USCWeb is irrelevant, but interesting and novel. —P

D.7   Economist

The URLs returned by each system for the "Economist" home page are shown in Table D.14. *The Economist* is a weekly magazine that focuses on business and politics worldwide. One of the sites returned by Excite was a list of magazines containing news and commentary; a second was a list of business-related magazines. A third was a list of resources for economists, another an advertisement for a book about an economist, and the last one an essay by Engels. Note Excite's tendency to be literal (honing in on the word "economist") and to include lists that contain the name of the seed page. In contrast, ParaSite returned the home pages of two other news services (CNN and *The New York Times*), two statistic-intensive U. S. government bureaus, and the home page of an organization that supports educational research. The quantitative ratings of the systems were very similar, with Excite judged slightly more relevant (1.90 vs. 1.58) and novel (1.80 vs. 152) and about equally interesting (1.70 vs. 1.72), as shown in Table D.15. A subject summarized:

Excite	ParaSite
netfind.aol.com/aol/Reviews/News_and_Reference/ News_and_Commentary_Magazines/index.netfind.html *AOL NetFind: Reviews: News & Commentary Magazines*	www.cnn.com/ *CNN Interactive*
econwpa.wustl.edu/EconFAQ/EconFAQ.html *Resources for Economists on the Internet*	www.nytimes.com/ *The New York Times on the Web*
www.ecw.ca/Press/publications/stephen_leacock.htm *STEPHEN LEACOCK*	stats.bls.gov/blshome.html *Bureau of Labor Statistics*
www.uflib.ufl.edu/cm/business/stand.html *Business Library: Business Newsstand*	tikkun.ed.asu.edu/aera/home.html *American Educational Research Association*
leftside.uwc.ac.za/Archive/1844-DFJ/outlines.htm 1844: Outlines of a Critique of Political Economy	www.census.gov/ U.S. Census Bureau Home Page

Table D.14: Top 5 Pages Returned by Excite and ParaSite for Economist Seed URL (http://www.economist.com).

P r i n	K r i n	W r i n	S r i n	Title	Average r	i	n	prod- uct
3 3 2	2 2 2	3 3 1	3 1 1	AOL NetFind: Reviews: News. . .	2.75	2.25	1.5	9.28
3 3 3	2 1 3	3 3 1	1 1 1	Resources for Economists on the Internet	2.25	2	2	9.00
1 2 3	1 0 3	1 0 1	0 0 0	STEPHEN LEACOCK	0.75	0.5	1.75	0.66
3 2 2	2 2 2	3 3 1	3 2 1	Business Library: Business Newsstand	2.75	2.25	1.5	9.28
1 2 3	1 1 3	2 2 3	0 1 0	1844: Outlines of a Critique. . .	1	1.5	2.25	3.38
				Excite averages	1.90	1.70	1.80	6.32
- - -	1 3 0	2 2 2	2 2 2	CNN Interactive	1.5	2	1.33	4.00
2 2 1	1 1 0	3 3 1	3 2 2	The New York Times on the Web	2.25	2	1	4.50
2 2 3	1 1 3	3 3 2	1 2 2	Bureau of Labor Statistics	1.75	2	2.5	8.75
1 1 2	0 0 3	1 1 1	- - -	AERA	0.67	0.67	1	0.44
2 3 3	1 1 2	3 2 1	1 2 1	U.S. Census Bureau Home Page	1.75	2	1.75	6.13
				ParaSite averages	1.58	1.73	1.52	4.76

Table D.15: User Ratings of Economist Recommendations

It depends whether the originator is more interested in economics, current events or economic data. I am assuming that it is mainly the first two.

The first 2 suggestions by System A [Excite] are excellent. Most suggestions by both systems are rasonably relevant with System B [ParaSite] a bit more oriented to data and statistics.

A slight edge for System A [Excite]. —P