

Supplementary Material for: Point-of-Interest Recommender Systems based on Location-Based Social Networks: A Survey from an Experimental Perspective

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1 SUPPLEMENTARY MATERIAL

In Table 1 we show an expanded version of Table 9 of the original paper. In this table, every reference where each instance of the Foursquare dataset is used can be found. Additionally, Tables 2, 3, 4, 5, 6 and 7 show all the papers that we analyzed in the survey, instead of only the most representative ones. This information can also be obtained online¹. Note that in these tables we have considered the textual information to be a special type of content information, although in the survey both are considered as independent sources of information.

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¹Available here: https://abelogin.github.io/poi_survey/.

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Table 1. Statistics of reported versions for the Foursquare dataset in works included in our review, sorted by number of check-ins.

Users	POIs	Check-ins	References using this dataset
114,508	62,462	1,434,668	[27, 85, 166, 167, 219]
11,326	182,968	1,385,223	[45, 46, 161, 185, 270, 271, 273–275]
10,766	10,695	1,336,278	[140, 142–144]
24,941	28,593	1,196,248	[16, 57, 124, 137, 201, 231, 259, 298]
2,293	61,858	573,703	[145, 296, 297]
7,642	28,484	512,523	[109, 172, 173, 188]
4,163	121,142	483,813	[68–70, 148, 168, 220, 272]
1,083	38,333	227,428	[29, 32, 145, 296, 297]
2,321	5,596	194,108	[4, 21, 44, 79, 83, 101, 117, 119, 182, 183, 208, 209, 232, 253, 256, 257, 263, 282]
2,551	13,474	124,933	[87, 88, 189, 190]

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Table 2. Summary of analyzed POI recommendation approaches sorted by publication year.

Year	Reference	Details	Information used					Model						Split type		
		Acronym	Geographical	Social	Content	Sequential	Temporal	CF sims	Factorization	Probabilistic	DL	Graph/Link	Hybrid	Other	Random	Temporal
2011	[244]	USG	✓	✓				✓		✓		✓		✓		
2012	[86]	LARS	✓					✓						✓		
2012	[7]	(N.A.)	✓		✓			✓			✓					✓
2012	[249]	UPOI-Mine	✓	✓	✓			✓				✓				
2012	[156]	RW, Weighted-RW		✓						✓					✓	
2013	[294]	CRTCF		✓	✓			✓	✓	✓						✓
2013	[284]	GMM (1), GA-GMM (2)	✓							✓			2		✓	
2013	[170]	PCLR	✓		✓		✓			✓		✓				
2013	[191]	GeoSocialRec							✓					✓		
2013	[235]	LBSMF		✓	✓			✓	✓	✓				✓		
2013	[129]	(N.A.)		✓							✓			✓		
2013	[115]	TL-PMF			✓				✓	✓				✓		
2013	[26]	CLW		✓			✓	✓				✓		✓		
2013	[126]	(N.A.)	✓		✓	✓	✓	✓	✓	✓		✓			✓	
2013	[37]	UPS-CF		✓				✓						✓		
2013	[113]	GT-BNMF	✓		✓				✓	✓				✓		
2013	[25]	FPMC-LR	✓			✓			✓	✓					✓	
2013	[40]	LRT					✓		✓					✓		
2013	[203]	LFBCA	✓	✓							✓				✓	
2013	[270]	iGSLR	✓	✓				✓		✓		✓		✓		
2013	[256]	UTE+SE	✓				✓	✓		✓		✓		✓		
2014	[130]	Ricochet			✓		✓					✓				✓
2014	[159]	MO	✓	✓				✓							✓	
2014	[84]	PNN	✓	✓			✓			✓	✓			✓		
2014	[291]	BPTFSLR		✓			✓		✓	✓				✓		✓
2014	[71]	ST		✓	✓				✓	✓				✓		
2014	[157]	DGM	✓					✓			✓			✓		
2014	[199]	GPUR, GPLR	✓	✓	✓			✓						✓		
2014	[310]	ITF	✓						✓					✓		
2014	[248]	UPOI-Walk	✓	✓	✓						✓					
2014	[257]	GTAG	✓				✓				✓			✓		
2014	[109]	GeoMF	✓						✓					✓		
2014	[128]	IRenMF	✓						✓					✓		
2014	[274]	LORE	✓	✓		✓		✓		✓		✓		✓		✓
2014	[299]	sPCLR	✓		✓		✓	✓				✓		✓		
2015	[38]	(N.A.)					✓						✓		✓	
2015	[180]	EFC					✓	✓	✓			✓		✓		
2015	[42]	gSCorr	✓	✓			✓	✓	✓	✓		✓		✓		
2015	[83]	URG+SM	✓				✓	✓	✓	✓		✓				
2015	[58]	TSLR (1), TSLRS (2)	2		✓				✓	✓				✓		
2015	[6]	RWCAR	✓	✓	✓						✓				✓	
2015	[72]	FGLR	✓	✓					✓	✓					✓	
2015	[261]	City Melange			✓				✓	✓	✓	✓	✓			✓
2015	[151]	REGULA	✓	✓			✓					✓		✓		
2015	[278]	LTSCR	✓	✓			✓		✓					✓		
2015	[51]	GeoMF-TD	✓				✓		✓					✓		
2015	[112]	USPB	✓	✓				✓		✓		✓		✓		
2015	[275]	iGeoRec	✓							✓					✓	
2015	[241]	TenInt		✓			✓		✓					✓		
2015	[104]	TCL-K					✓		✓	✓					✓	
2015	[245]	LA-LDA	✓		✓				✓	✓				✓		
2015	[134]	LURA	✓	✓	✓		✓	✓	✓	✓		✓		✓		
2015	[211]	UGC			✓			✓	✓					✓		
2015	[165]	HRWR		✓	✓						✓					
2015	[62]	(N.A.)	✓	✓	✓						✓			✓		
2015	[103]	MARS			✓				✓							✓
2015	[289]	TA-FPMC	✓		✓	✓	✓		✓	✓				✓		
2015	[271]	CoRe	✓	✓				✓		✓		✓			✓	
2015	[1]	STS	✓		✓		✓	✓				✓		✓		
2015	[276]	ORec	✓	✓	✓			✓		✓		✓		✓		
2015	[116]	Poisson Geo-PFM	✓						✓	✓				✓		

Table 3. Summary of analyzed POI recommendation approaches (same configuration as Table 2).

Year	Reference	Details Acronym	Information used					Model						Split type			
			Geographical	Social	Content	Sequential	Temporal	CF sims	Factorization	Probabilistic	DL	Graph/Link	Hybrid	Other	Random	Temporal	Other
2015	[101]	RankGeoFM	✓				✓		✓							✓	
2015	[272]	GeoSoCa	✓	✓	✓					✓						✓	
2015	[36]	PRME-G	✓			✓	✓		✓	✓						✓	
2015	[41]	CAPRF			✓				✓							✓	
2015	[90]	SFPMF,UIPMF	✓	✓						✓			✓			✓	
2015	[106]	ICCF			✓				✓							✓	
2016	[95]	(N.A.)	✓		✓	✓	✓								✓	✓	
2016	[196]	(N.A.)			✓									✓			✓
2016	[155]	(N.A.)			✓							✓					✓
2016	[195]	(N.A.)	✓		✓		✓									✓	
2016	[15]	GeoSRS			✓				✓	✓			✓			✓	
2016	[91]	CPMFPPC					✓		✓	✓	✓			✓		✓	
2016	[63]	(N.A.)	✓		✓								✓				
2016	[243]	TM-PFM			✓				✓	✓						✓	
2016	[108]	RCTF	✓				✓		✓	✓						✓	
2016	[3]	IALBR	✓		✓							✓	✓				✓
2016	[185]	(N.A.)	✓	✓				✓					✓			✓	
2016	[160]	(N.A.)		✓			✓	✓								✓	
2016	[219]	GE	✓		✓	✓	✓		✓	✓			✓			✓	
2016	[139]	DeepReg		✓	✓				✓							✓	
2016	[307]	(N.A.)			✓		✓		✓							✓	
2016	[20]	(N.A.)	✓		✓	✓			✓	✓			✓			✓	
2016	[258]	STS_Grid, STS_DBSCAN	✓				✓	✓								✓	
2016	[163]	(N.A.)	✓		✓			✓									✓
2016	[9]	MAPS	✓	✓	✓		✓					✓				✓	
2016	[24]	BPRLR1, BPRLR2	✓						✓	✓			✓			✓	
2016	[78]	(N.A.)			✓			✓									✓
2016	[34]	PNS (1), CNF (2)	✓		✓			2		1							✓
2016	[273]	TICRec	✓	✓			✓	✓		✓						✓	
2016	[68]	USGT	✓	✓			✓	✓		✓			✓			✓	
2016	[269]	CTS	✓				✓	✓					✓			✓	
2016	[54]	CoSoLoRec	✓	✓	✓		✓	✓	✓				✓			✓	
2016	[29]	PLTSRS				✓		✓	✓				✓			✓	
2016	[89]	STPMF	✓		✓		✓		✓	✓						✓	
2016	[230]	Topical-GeoMF	✓		✓				✓							✓	
2016	[145]	CoTF			✓	✓			✓							✓	
2016	[22]	MUG	✓						✓	✓			✓				
2016	[286]	ATTF					✓		✓		✓					✓	
2016	[292]	TGTM-1, TGTM-2	✓		✓		✓		✓	✓						✓	
2016	[227]	SSR	✓	✓	✓							✓				✓	
2016	[179]	MultiGran					✓	✓								✓	✓
2016	[35]	SSR		✓									✓			✓	
2016	[267]	SGMF	✓	✓				✓					✓			✓	
2016	[11]	GeoTeCS	✓	✓	✓		✓		✓	✓						✓	
2016	[205]	RC, DCC	✓		✓			✓						✓		✓	
2016	[220]	GME (1), GME-S (2)				2	✓		✓	✓						✓	
2016	[81]	(N.A.)										✓				✓	
2016	[53]	(N.A.)	✓	✓	✓		✓	✓		✓			✓				
2016	[308]	(N.A.)			✓				✓	✓			✓				✓
2016	[87]	ASMF	✓	✓	✓				✓			✓				✓	
2016	[288]	STELLAR					✓		✓							✓	
2016	[67]	(N.A.)	✓			✓			✓								
2016	[127]	WWO			✓	✓			✓	✓						✓	
2016	[136]	ELR-DC		✓				✓								✓	
2016	[255]	GeoBPR	✓						✓	✓						✓	
2017	[178]	(N.A.)	✓	✓	✓			✓								✓	
2017	[82]	USTT _c	✓		✓			✓					✓			✓	✓
2017	[287]	Geo-Teaser	✓			✓	✓		✓	✓						✓	
2017	[282]	HGMF	✓						✓							✓	
2017	[141]	PRFMC	✓	✓					✓	✓			✓			✓	
2017	[140]	GRMF, MLRP	✓			✓			✓		✓		✓			✓	
2017	[176]	SPTW			✓				✓			✓					

Table 4. Summary of analyzed POI recommendation approaches (same configuration as Table 2).

Details			Information used					Model							Split type		
Year	Reference	Acronym	Geographical	Social	Content	Sequential	Temporal	CF sims	Factorization	Probabilistic	DL	Graph/Link	Hybrid	Other	Random	Temporal	Other
2017	[194]	TPR-UM	✓				✓		✓	✓					✓		
2017	[49]	UGSE-LR	✓			✓		✓				✓	✓		✓		
2017	[218]	VReR			✓		✓							✓			
2017	[239]	TDLDA, TATD			✓		✓		✓	✓					✓		
2017	[158]	CLB				✓	✓	✓							✓		
2017	[19]	(N.A.)			✓		✓	✓					✓	✓	✓		
2017	[234]	PACE	✓	✓							✓					✓	
2017	[198]	LSARS	✓		✓				✓	✓					✓		
2017	[182]	CTF-ARA				✓	✓	✓							✓		
2017	[59]	AGSG	✓	✓	✓							✓			✓		
2017	[197]	(N.A.)		✓								✓					
2017	[135]	PCTF			✓		✓		✓						✓		
2017	[250]	TAP		✓	✓		✓		✓			✓			✓		
2017	[177]	TGSC-PMF	✓	✓	✓				✓	✓					✓		
2017	[306]	SEM-PPA	✓	✓	✓	✓						✓				✓	
2017	[253]	(N.A.)								✓		✓			✓		
2017	[175]	EIUCF, EIICF			✓			✓					✓		✓		
2017	[64]	(N.A.)	✓		✓				✓	✓					✓		
2017	[66]	LBPR	✓		✓	✓			✓	✓			✓			✓	
2017	[88]	IEMF	✓						✓							✓	
2017	[285]	Geo-PRMF	✓												✓		
2017	[207]	VPOI			✓				✓	✓	✓				✓		
2017	[171]	LBA, BF	✓		✓		✓		✓	✓			2		✓		
2017	[94]	CBGeoMFC	✓		✓			✓	✓	✓					✓		
2017	[69]	NH-JTI					✓	✓	✓	✓					✓		
2017	[233]	SCCF		✓	✓				✓				✓				
2017	[217]	ARNN	✓		✓	✓					✓					✓	
2017	[262]	TSG	✓	✓				✓				✓			✓		
2017	[228]	SSLR	✓	✓		✓				✓		✓	✓			✓	
2017	[181]	LST	✓			✓		✓					✓		✓		
2017	[221]	(N.A.)	✓			✓	✓					✓			✓		
2017	[33]	(N.A.)		✓	✓			✓					✓				
2018	[23]	(N.A.)			✓			✓					✓		✓		
2018	[122]	(N.A.)	✓			✓	✓			✓			✓		✓		
2018	[120]	PCRM			✓				✓	✓					✓		
2018	[46]	STSCR		✓		✓	✓		✓	✓					✓		
2018	[166]	TransTL	✓			✓	✓		✓	✓						✓	
2018	[52]	ALGeoSPF	✓			✓			✓	✓							
2018	[137]	SAE-NAD	✓								✓				✓		
2018	[309]	LTSR	✓	✓			✓	✓	✓	✓			✓			✓	
2018	[290]	GR-DELM	✓	✓				✓	✓	✓		✓			✓		
2018	[223]	ReGS	✓	✓	✓			✓	✓	✓	✓					✓	
2018	[5]	LocRec		✓		✓	✓							✓	✓		
2018	[200]	ULE	✓	✓				✓	✓	✓			✓		✓		
2018	[110]	(N.A.)			✓		✓		✓	✓							
2018	[12]	ReEI	✓		✓				✓		✓				✓		
2018	[45]	GSBPR	✓	✓					✓	✓					✓		
2018	[229]	BTC			✓		✓							✓			✓
2018	[142]	CARA	✓			✓	✓				✓					✓	
2018	[232]	GeoUMF	✓						✓						✓		
2018	[118]	(N.A.)					✓		✓							✓	
2018	[204]	(N.A.)	✓		✓		✓		✓					✓			✓
2018	[56]	NBPR	✓					✓		✓					✓		
2018	[187]	CUSPG	✓	✓						✓			✓			✓	
2018	[10]	FCDST (1), MF(2)	✓	✓	✓		✓		2				1		✓		
2018	[242]	TenMF	✓	✓			✓		✓						✓		
2018	[47]	GeoEISo	✓	✓					✓	✓					✓		
2018	[305]	TSG	✓	✓				✓		✓		✓	✓		✓		
2018	[43]	ABPR	✓		✓					✓							

Table 5. Summary of analyzed POI recommendation approaches (same configuration as Table 2).

Details			Information used					Model							Split type		
Year	Reference	Acronym	Geographical	Social	Content	Sequential	Temporal	CF sims	Factorization	Probabilistic	DL	Graph/Link	Hybrid	Other	Random	Temporal	Other
2018	[152]	APPR	✓		✓	✓	✓			✓						✓	
2018	[212]	DeepRec	✓	✓			✓				✓				✓		
2018	[202]	GeoIE	✓						✓	✓						✓	
2018	[302]	ImSoRec	✓	✓					✓	✓			✓		✓		
2018	[277]	CGA	✓	✓							✓	✓				✓	
2018	[295]	(N.A.)	✓				✓		✓	✓					✓		
2018	[164]	(N.A.)	✓	✓	✓							✓			✓		
2018	[21]	(N.A.)	✓		✓		✓	✓		✓			✓		✓		
2018	[30]	ST-DME	✓			✓	✓				✓		✓			✓	
2018	[279]	TSG-list MF	✓	✓	✓				✓				✓		✓		
2018	[216]	LBIMC							✓							✓	
2018	[238]	MFRA		✓	✓			✓					✓		✓		
2018	[97]	TMCA	✓		✓	✓	✓				✓					✓	
2018	[27]	JLGE	✓	✓			✓		✓						✓		
2018	[192]	TCENR			✓						✓				✓		
2019	[144]	DRTL				✓			✓		✓					✓	
2019	[61]	(N.A.)		✓	✓		✓	✓					✓				
2019	[210]	(N.A.)	✓	✓	✓				✓		✓		✓		✓		
2019	[79]	CCS-POI-RS	✓			✓	✓				✓					✓	
2019	[268]	HWREC	✓			✓	✓	✓						✓		✓	
2019	[57]	L-WMF	✓					✓	✓	✓						✓	
2019	[75]	(N.A.)	✓			✓	✓		✓				✓			✓	
2019	[301]	UFC	✓	✓				✓		✓		✓	✓				
2019	[300]	AKAWO			✓		✓					✓	✓	✓	✓		
2019	[8]	HiRecS	✓	✓	✓		✓			✓			✓	✓	✓		
2019	[102]	GPDM, PPDM	✓		✓	✓			✓	✓						✓	
2019	[174]	CATAPE			✓	✓					✓					✓	
2019	[247]	MEAP-T				✓	✓		✓	✓						✓	
2019	[280]	VCG	✓	✓	✓				✓	✓			✓		✓		
2019	[65]	RealTime-MF			✓				✓		✓				✓		
2019	[44]	ST-RNet	✓				✓				✓				✓		
2019	[13]	LC-G-P	✓	✓				✓				✓	✓				
2019	[246]	ADPR	✓		✓					✓	✓					✓	
2019	[189]	PRFPF	✓	✓					✓	✓						✓	
2019	[74]	(N.A.)	✓			✓						✓			✓		
2019	[124]	GT-HAN	✓			✓	✓				✓					✓	
2019	[92]	LORI	✓				✓	✓		✓			✓			✓	
2019	[265]	(N.A.)			✓											✓	
2019	[133]	PEU-RNN	✓			✓					✓				✓		
2019	[70]	MATI					✓		✓	✓					✓		
2019	[76]	R2SIGTP	✓				✓		✓				✓				✓
2019	[252]	DMGMT	✓		✓		✓		✓	✓			✓				
2019	[105]	PA-Seq2Seq	✓			✓	✓				✓					✓	
2019	[125]	HMM			✓	✓				✓							
2019	[222]	CPC	✓		✓				✓	✓	✓				✓		
2019	[240]	NRLRS	✓	✓	✓				✓	✓		✓			✓		
2019	[50]	MLR	✓	✓				✓		✓				✓	✓	✓	
2019	[28]	UGR	✓					✓					✓		✓		
2019	[39]	U-CF-Memory					✓	✓								✓	
2019	[60]	AGS-MF	✓	✓	✓				✓			✓				✓	
2019	[193]	(N.A.)	✓	✓	✓	✓		✓		✓			✓				
2019	[183]	APRA-SA	✓				✓			✓			✓		✓		
2019	[55]	Geo-SRank	✓	✓					✓	✓	✓				✓		
2019	[303]	SG-NeuRec	✓	✓			✓				✓					✓	
2019	[231]	SSSER	✓	✓		✓				✓	✓				✓		
2019	[169]	BLR	✓		✓	✓	✓			✓			✓		✓		

Table 6. Summary of analyzed POI recommendation approaches (same configuration as Table 2).

Details			Information used					Model							Split type		
Year	Reference	Acronym	Geographical	Social	Content	Sequential	Temporal	CF sims	Factorization	Probabilistic	DL	Graph/Link	Hybrid	Other	Random	Temporal	Other
2019	[31]	ASTEN	✓			✓	✓				✓				✓		
2019	[251]	HeteGeoRanRec	✓	✓	✓				✓	✓						✓	
2019	[167]	STA	✓				✓	✓								✓	
2019	[186]	WBPR-DST	✓				✓			✓					✓		
2019	[263]	RBMNMF							✓		✓		✓		✓		
2019	[77]	(N.A.)	✓		✓	✓	✓	✓					✓			✓	
2019	[121]	BPRSoReg		✓					✓	✓						✓	
2019	[283]	STGN	✓			✓	✓				✓					✓	
2019	[260]	GFP-LORE	✓	✓		✓				✓			✓			✓	
2019	[214]	TTR	✓			✓				✓			✓			✓	
2019	[161]	DPGSR-PR	✓	✓					✓	✓		✓				✓	
2019	[236]	SGBA	✓	✓		✓					✓	✓	✓				
2019	[2]	(N.A.)		✓								✓			✓		
2019	[148]	(N.A.)				✓	✓				✓					✓	
2019	[48]	DLM	✓		✓				✓	✓	✓				✓		
2019	[150]	(N.A.)	✓	✓	✓			✓	✓				✓		✓		
2019	[304]	NCFT	✓	✓	✓	✓	✓				✓					✓	
2019	[172]	LGLMF	✓						✓				✓			✓	
2019	[213]	HRPR	✓			✓				✓	✓	✓			✓		
2020	[131]	MCLR-TD			✓		✓	✓	✓							✓	
2020	[293]	ADPM	✓			✓	✓				✓					✓	
2020	[32]	(N.A.)	✓				✓	✓		✓			✓			✓	
2020	[18]	(N.A.)	✓											✓		✓	
2020	[206]	TPR-TF		✓			✓	✓	✓						✓		
2020	[184]	(N.A.)			✓		✓		✓							✓	
2020	[132]	GLR	✓		✓		✓			✓	✓		✓			✓	
2020	[297]	PDPNN	✓			✓	✓				✓						
2020	[17]	MANC	✓	✓					✓		✓						✓
2020	[117]	GeoSeDMF	✓						✓								✓
2020	[173]	STACP	✓				✓		✓				✓			✓	
2020	[237]	GSSM	✓	✓				✓		✓			✓			✓	
2020	[296]	MTNR	✓			✓	✓				✓					✓	
2020	[154]	STSAN	✓			✓	✓				✓					✓	
2020	[264]	DPR-Geo	✓							✓	✓		✓		✓		
2020	[80]	SVD++,FMRec	✓	✓			✓		✓						✓		
2020	[138]	UPEMF	✓						✓	✓					✓		
2020	[259]	SSANet	✓	✓			✓			✓	✓						
2020	[201]	STAR	✓				✓				✓					✓	
2020	[4]	JTCR	✓				✓							✓		✓	
2020	[14]	Rank-FBPR	✓	✓						✓	✓		✓		✓		
2020	[114]	VGMF	✓		✓				✓		✓						
2020	[93]	BPSL	✓	✓	✓		✓	✓		✓			✓		✓		
2020	[153]	(N.A.)		✓		✓	✓	✓							✓		
2020	[224]	HI-LDA	✓	✓	✓				✓	✓					✓		
2020	[99]	SACRA	✓							✓	✓					✓	
2020	[147]	MLRS			✓						✓				✓		
2020	[119]	GeSSo	✓	✓				✓		✓			✓			✓	
2020	[149]	(N.A.)			✓		✓						✓	✓		✓	
2020	[98]	SEATLE	✓							✓	✓						
2020	[254]	(N.A.)				✓	✓			✓	✓					✓	
2020	[208]	GAIMC	✓						✓	✓					✓		
2020	[281]	SPR	✓		✓				✓						✓		
2020	[188]	FGCRec	✓							✓						✓	
2020	[266]	KEAN		✓		✓		✓								✓	
2020	[190]	FGRec	✓	✓	✓		✓	✓	✓			✓				✓	
2020	[73]	MMBE	✓	✓	✓	✓	✓			✓						✓	
2020	[96]	(N.A.)	✓	✓	✓		✓	✓	✓								
2020	[107]	GeoSAN	✓				✓				✓					✓	

Table 7. Summary of analyzed POI recommendation approaches (same configuration as Table 2).

Details			Information used					Model							Split type		
Year	Reference	Acronym	Geographical	Social	Content	Sequential	Temporal	CF sims	Factorization	Probabilistic	DL	Graph/Link	Hybrid	Other	Random	Temporal	Other
2020	[209]	TECF	✓				✓	✓		✓	✓	✓	✓		✓		
2020	[146]	FPR	✓		✓			✓							✓		
2020	[100]	STS	✓		✓	✓	✓			✓			✓			✓	
2020	[215]	MTPR	✓			✓					✓					✓	
2020	[16]	GGLR	✓								✓					✓	
2020	[111]	STP-UDGAT	✓			✓	✓				✓	✓				✓	
2020	[298]	HGMAP	✓	✓							✓				✓		
2020	[162]	HAM-POIRec			✓	✓	✓				✓				✓		
2020	[123]	(N.A.)	✓		✓			✓					✓		✓		
2020	[85]	(N.A.)	✓			✓				✓						✓	
2020	[168]	UP2VEC	✓	✓		✓	✓			✓	✓	✓				✓	
2020	[226]	Dystal	✓	✓	✓					✓	✓				✓		
2020	[143]	CRCF	✓			✓	✓				✓					✓	
2020	[225]	MTAS	✓	✓			✓		✓	✓					✓		

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