

# Literature Survey

Helmut Simonis

## Constraint Based Production Scheduling

## Licence

This work is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc-sa/4.0/>.

This license requires that reusers give credit to the creator. It allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, for noncommercial purposes only. If others modify or adapt the material, they must license the modified material under identical terms.



# Acknowledgments



This publication was developed as part of the ENTIRE EDIH project, which received funding from Enterprise Ireland and the European Commission.

Part of this work is based on research conducted with the financial support of Science Foundation Ireland under Grant number 12/RC/2289-P2 at Insight the SFI Research Centre for Data Analytics at UCC, which is co-funded under the European Regional Development Fund.

Part of this work is based on research conducted within the ASSISTANT European project, under the framework program Horizon 2020, ICT-38-2020, Artificial intelligence for manufacturing, grant agreement number 101000165.

## Key Points



- We are working on a survey of the existing CP & Scheduling literature
- Considers over 1200 papers
- Current version of survey available at <https://hsimonis.github.io/pthg24>

# A Survey of the Existing Literature



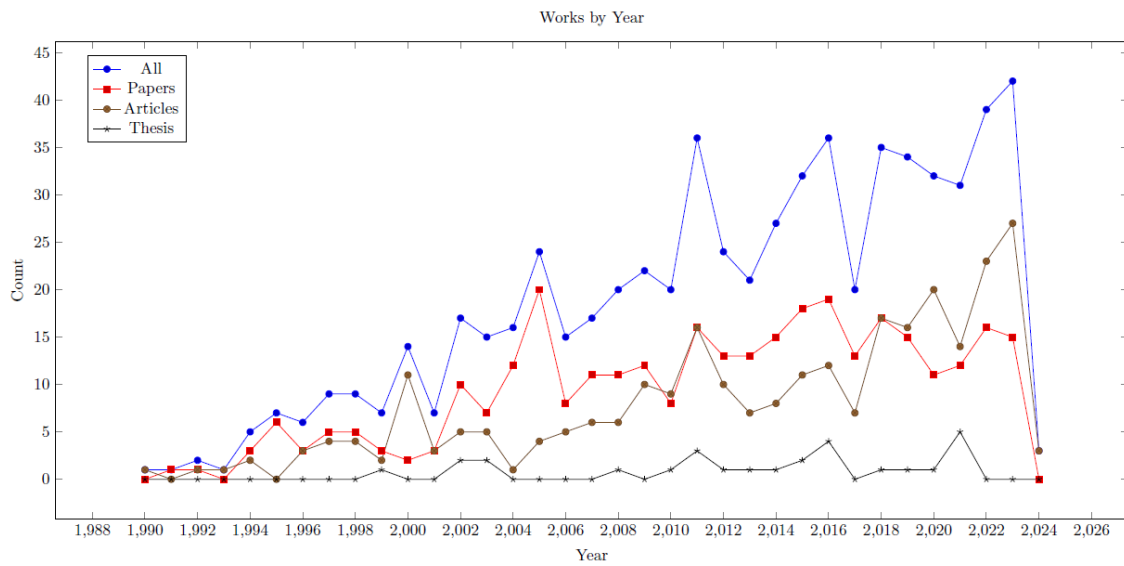
- Joint work with Cemalettin Ozturk, MTU
- What is out there
- Where to start
- Where to publish
- I'm interested in some specific topic, what is relevant

## Methodology

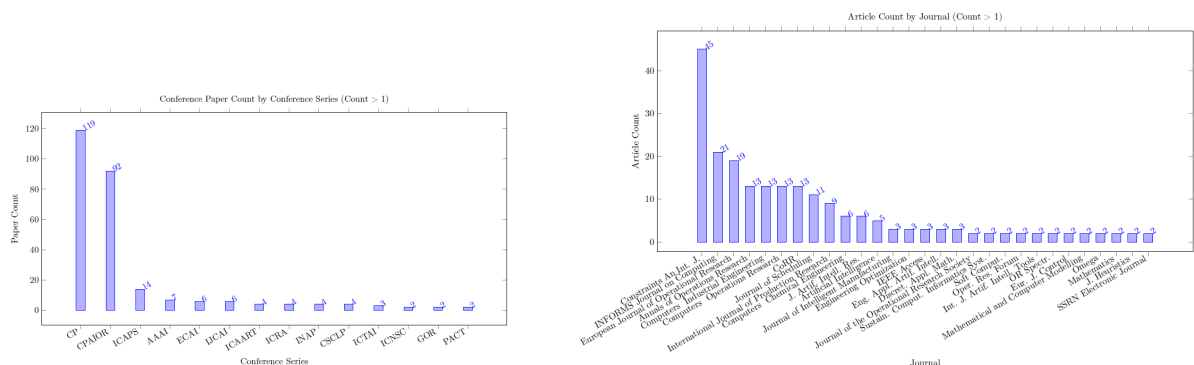


- Manually curated list of works, somewhat inclusive
- Starting with bibtex files
- Citation links through OpenCitations (open access)
- Content analysis on local copies of pdf files
- Closure of domain by analyzing missing cited and citing works
- Limited manual analysis of works (datasets, code)
- Results presented as LaTeX documents
- Open source analysis on git:  
<https://hsimonis.github.io/pthg24/>

# Overall Analysis (Based on 671 Works)



# Origin of Papers/Articles



# Most Recent Articles



Table 5: Works from bibtex (Total 274)

Key	Authors	Title	LC	Cite	Year	Conference / Journal	Pages	Nr Cites	Nr Refs	b	c
ForbesHJST24 ForbesHJST24	M. Forbes, M. Harris, H. Jansen, F.A. van der Schoot, P. Talmir	Combining optimisation and simulation using logic-based Benders decomposition	Yes	[217]	2024	European Journal of Operational Research	15	0	26	1314	1490
PrataAN23 PrataAN23	Bruno A. Prata, Levi R. Abreu, Marcelo S. Nagano	Applications of constraint programming in production scheduling problems: A descriptive bibliometric analysis	Yes	[509]	2024	Results in Control and Optimization	17	0	0	1427	1497
abs-2402-00459 abs-2402-00459 AbreuNP23 AbreuNP23	S. Nguyen, Dhananjay R. Thiruvady, Y. Sun, M. Zhang, Levi Ribeiro de Abreu, Marcelo Seido Nagano, Bruno A. Prata	Genetic-based Constraint Programming for Resource Constrained Job Scheduling A new two-stage constraint programming approach for open shop scheduling problem with machine blocking	Yes	[469]	2024	CoRR	21	0	0	1495	1498
AbreuPNF23 AbreuPNF23	Levi R. Abreu, Bruno A. Prata, Marcelo S. Nagano, Jose M. Framinan	A constraint programming-based iterated greedy algorithm for the open shop with sequence-dependent processing times and makespan minimization	Yes	[9]	2023	International Journal of Production Research	20	1	47	1243	1499
Adelgren2023 Adelgren2023	N. Adelgren, Christos T. Maravelias	On the utility of production scheduling formulations including record keeping variables	Yes	[2]	2023	Computers Industrial Engineering	12	0	43	1245	1501
AfsarVPG23 AfsarVPG23	S. Afsar, Camino R. Vela, Juan José Palacios, L. González-Rodríguez	Mathematical models and benchmarking for the fuzzy job shop scheduling problem	Yes	[8]	2023	Computers Industrial Engineering	14	0	50	1246	1502
AkramNHRSa23 AkramNHRSa23	Blal Omar Akram, Nor Kumarish Noordin, P. Hashim, Mohd Fadlee A. Rasid, Mustafa Ismail, Salman, Abdulrahman M. Abdalghani	Joint Scheduling and Routing Optimization for Deterministic Hybrid Traffic in Time-Sensitive Networks Using Constraint Programming	Yes	[13]	2023	IEEE Access	16	0	0	1248	1503
AlfieriGPS23 AlfieriGPS23	A. Alfieri, M. Garraffa, E. Pastore, F. Salassa	Permutation flowshop problems minimizing core waiting time and core idle time	Yes	[15]	2023	Computers Industrial Engineering	13	0	37	1249	1504
Caballero23 Caballero23	Jordi Coll Caballero	Scheduling through logic-based tools	Yes	[127]	2023	Constraints An Int. J.	1	0	0	1287	1505
CzerniachowskaWZ23 CzerniachowskaWZ23	K. Czerniachowska, R. Wichniarek, K. Zywicki	Constraint Programming for Flexible Flow Shop Scheduling Problem with Repeated Jobs and Repeated Operations	Yes	[159]	2023	Advances in Science and Technology Research Journal	14	0	0	1297	1506
FahimiQ23 FahimiQ23	H. Fahimi, C. Quimper	Overload-Checking and Edge-Finding for Robust Cumulative Scheduling	No	[207]	2023	INFORMS Journal on Computing	null	0	16	No	1507
Fatemi-AnarakiTFV23 Fatemi-AnarakiTFV23	S. Fatemi-Anaraki, R. Tavakkoli-Moghaddam, M. Fomani, B. Vahedi-Nouri	Scheduling of Multi-Robot Job Shop Systems in Dynamic Environments: Mixed-Integer Linear Programming and Constraint Programming Approaches	Yes	[212]	2023	Omega	15	7	60	1312	1508
GhasemiMH23 GhasemiMH23	S. Ghasemi, R. Tavakkoli-Moghaddam, M. Hamdi	Operating room scheduling by emphasizing human factors and dynamic decision-making styles: a constraint programming method	No	[242]	2023	International Journal of Systems Science: Operations Logistics	null	0	104	No	1509
GuoZ23 GuoZ23	P. Guo, J. Zhu	Capacity reservation for humanitarian relief: A logic-based Benders decomposition method with subgradient cut	Yes	[269]	2023	European Journal of Operational Research	29	0	112	1329	1510
GurPAE23 GurPAE23	S. Gür, M. Pinarbası, Haci Mehmet Alakası, T. Eren	Operating room scheduling with surgical team: a new approach with constraint programming and goal programming	Yes	[270]	2023	Central Eur. J. Oper. Res.	25	1	40	1327	1511
IsikYA23 IsikYA23	Eytap Ensar Isik, Seyda Topaloglu Yildiz, Özge Satir Akpunar	Constraint programming models for the hybrid flow shop scheduling problem and its extensions	Yes	[321]	2023	Soft Comput.	28	0	127	1350	1512
JuvinHL23a JuvinHL23a	C. Juvin, L. Housain, P. Lopez	Logic-based Benders decomposition for the preemptive flexible job-shop scheduling problem	Yes	[331]	2023	Computers Operations Research	17	0	40	1355	1513
LacknerMMWW23 LacknerMMWW23	M. Lackner, C. Mrkvicka, N. Mustiju, D. Walkiewicz, F. Winter	Exact methods for the Oven Scheduling Problem	Yes	[374]	2023	Constraints An Int. J.	42	0	32	1371	1514

# Automatically Extracted Article Features



Table 6: Automatically Extracted ARTICLE Properties (Requires Local Copy)

Work	Pages	Concepts	Classification	Constraints	Prog Languages	CP Systems	Areas	Industries	Benchmarks	Algorithm	a	c
Laborie03 [399]	38	task, precedence, order, cmax, machine, job, activity, re-scheduling, setup-time, release-date, inventory, preempt, job-shop, resource, scheduling, make-span		cycle, table constraint, cumulative, disjunctive	C++	Ilog Scheduler			benchmark	edge-finding, not-last, energetic reasoning, not-first, time-tabling edge-finding	1201	1731
LaborieRSV18 [372]	41	release-date, job-shop, resource, activity, precedence, sequence dependent setup, earliness, scheduling, machine, inventory, transportation, manpower, due-date, setup-time, batch process, order, tardiness, flow-shop, job, make-span, re-scheduling, task, distributed	psplib, parallel machine, RCPSP	alternative constraint, cumulative, noOverlap, disjunctive, span constraint, cycle, alwaysIn, endBeforeStart	C, Python, C++, Java	CHiP, Gecode, Ilog Solver, Cplex, Ilog Scheduler, OPL, Choco Solver, CPO	semiconductor railway, container terminal, satellite, robot, pipeline, aircraft, shipping line	chemical industry, petro-chemical industry	real-world, CSPLib, benchmark		1080	1610
LacknerMMWW23 [374]	42	release-date, batch process, setup-time, job, order, due-date, tardiness, scheduling, make-span, machine, task, lateness, job-shop, earliness	parallel machine, OSP, single machine	alternative constraint, disjunctive, bin-packing, noOverlap, cumulative, endBeforeStart		Chuffed, Cplex, OPL, CPO, OR-Tools, MiniZinc, Gurobi	semiconductor oven scheduling	electronics industry, steel industry, manufacturing industry	random instance, industrial partner, benchmark, instance generator, zenodo, real-life	time-tabling	984	1514
LammaMM07 [377]	15	job-shop, resource, scheduling, precedence, order, task, job, distributed, no-wait		circuit, disjunctive	C++, Prolog	ECLiPSe, OPL, CHiP	railway		generated real-life	instance, Rowdef, benchmark, random instance	1230	1760
LetortCB15 [385]	52	machine, make-span, job, precedence, resource, scheduling, task, order	psplib	cumulative, cycle, bin-packing	Java, Prolog	Choco Solver, CHiP, SICStus, Ilog Solver, OZ, Cplex, ECLiPSe, OPL, CHiP			generated instance, Rowdef, benchmark, random instance	energetic reasoning, sweep, edge-finding	1110	1640
LiW08 [386]	18	precedence, activity, resource, completion-time, setup-time, make-span, scheduling, machine, preempt, job-shop, no preempt, job, re-scheduling, open-shop, due-date, task, order	RCPSP	disjunctive, cycle, bin-packing							1178	1708
LiesM08 [388]	12	preempt, resource, scheduling, machine, job, activity, precedence, job-shop, task, make-span, order, cmax	RCPSP, psplib	disjunctive, cumulative	C++	OZ			benchmark	edge-finding	1179	1709
LimtanyakuSI2 [303]	32	release-date, scheduling, order, completion-time, job, resource, activity, tardiness, machine, due-date, precedence		table constraint, disjunctive, bin-packing, cumulative		OZ, Ilog Scheduler, Cplex	robot, automotive	automotive industry	random instance, generated instance, industrial partner, benchmark	not-last, energetic reasoning, not-first, edge-finding	1133	1663
LombardiM10a [402]	30	due-date, distributed, order, job, make-span, release-date, re-scheduling, task, completion-time, resource, activity, precedence, preempt, scheduling, machine	TCSP	cycle, span constraint, cumulative, disjunctive, table constraint	C	Cplex			real-world, benchmark, real-life	sweep	1160	1690

# Manually Extracted Article Features



Table 4: Manually Defined PAPER Properties

Key	Title (Local Copy)	CP System	Bench	Links	Data Avail	Sol Avail	Code Avail	Related To	Classification	Constraints	a	b
AalilanPG23	Optimization of Short-Term Underground Mine Planning Using Constraint Programming	CP Opt	real-world	1	n		n			?	1	925
AalilanPG23 [1]	Enhancing Hybrid CP-SAT Search for Disjunctive Scheduling	ARIES	real-world, github, benchmark	1	y		y	-	JSSP OSSP	-	2	371
Bit-Monnot23 [96]		CP Opt OR-Tools Mistral OR-Tools	benchmark, random instance, generated instance, real-life, industrial instance	3	n		n	-	CHSP	-	3	415
EfthymionY23	Predicting the Optimal Period for Cyclic Hoist Scheduling Problems											
JuvinHHL23	An Efficient Constraint Programming Approach to Preemptive Job Shop Scheduling	CP Opt Mistral	supplementary material, github, benchmark	6	ref		y		PJSSP	endBeforeStart span noOverlap	4	476
JuvinHL23	Constraint Programming for the Robust Two-Machine Flow-Shop Scheduling Problem with Endogenized Uncertainty	CP Opt Cplex	real-world	0	ref		n	-	Perm FSSP	endBeforeStart noOverlap sameSequence cumulative	5	477
KameugneFND23	Horizontally Elastic Edge Finder Rule for Cumulative Constraint Based on Slack and Density	?	benchmark	5	BL PSPlib		n	-	RCPPSPs		6	480
KimCMLLP23	Iterated Greedy Constraint Programming for Scheduling Steelmaking Continuous Casting	Gurobi OR-Tools	real-world, benchmark, zenodo	0	y		n	-	SCC	alternative noOverlap	7	485
Mehdizadeh-Somarin23	A Constraint Programming Model for a Reconfigurable Job Shop Scheduling Problem with Machine Availability	CP Opt	random instance	0	n		n	-	JSSP RMS	alternative endBeforeStart noOverlap	8	529
PerezGSL23	A Constraint Programming Model for Scheduling the Unloading of Trains in Ports	custom	real-world, generated instance	0	n		n	-	SUTP	table disjunctive	9	553
PovedaAA23	Partially Preemptive Multi Skill/Mode Resource-Constrained Project Scheduling with Generalized Precedence Relations and Calendars	CP Opt MiniZinc Chuffed	real-world, github, benchmark, industrial instance, real-life	4	y		y		PP-MS, MMRCPPSP/max-cal		10	557
SquillaciPR23	Scheduling Complex Observation Requests for a Constellation of Satellites: Large Neighborhood Search Approaches	Cplex Studio	github, benchmark	2	y		n	-	EOSP	?	11	584
TardivoDFMP23	Constraint Propagation on GPU: A Case Study for the Cumulative Constraint	MiniCPP MiniZinc	bitbucket, github, benchmark, real-world	9	PSPLib BL Pack		y	-	RCPPSP	cumulative	12	590
TasselGS23	An End-to-End Reinforcement Learning Approach for Job-Shop Scheduling Problems Based on Constraint Programming	custom Choco	industrial instance, real-world, supplementary material, github, benchmark	0	ref		y	-	JSSP	noOverlap	13	591
WangB23	Dynamic All-Different and Maximal Cliques Constraints for Fixed Job Scheduling	FaCile	real-world, random instance	0	(y)		n	[628]	FJS	-	14	620
YuraszekMC23	A competitive constraint programming approach for the group shop scheduling problem	CP Opt	github, benchmark	0	ref		n	-	GSSP	noOverlap endBeforeStart	15	633

# Extracted Features: Application Areas



Table 16: Works for Concepts of Type ApplicationAreas

Type	Keyword	High	Medium	Low
ApplicationAreas	COVID	GuoZ23 [269]	GebingerKMMW21 [234]	Fatemi-AnaraktTFV23 [212], Mehdizadeh-Somarin23 [430], GurPAE23 [270], JuvinHL23a [331], OujanaAY B22 [487], Lemos21 [381]
ApplicationAreas	HVAC	LimHTB16 [390], LimBTBB15 [391], GrimesOS14 [260]		
ApplicationAreas	agriculture			
ApplicationAreas	aircraft	PohlAK22 [502], WangB20 [628], TranDRFWOVB16 [596], Fahimi16 [205], BajestaniB13 [42], LombardiM12 [405], BajestaniB11 [41], FrankKG5 [219], ArtouchineB05 [84], Simonis99 [558]	WangB23 [629], GomolayWS18 [253], Ham18 [273], Simonis07 [559], SakkoutW00 [529], Simonis95a [556]	AkramNHRSA23 [13], BenderWS21 [84], HamPK21 [275], Astrand21 [35], QinWLS21 [511], AstrandOF21 [59], MolinY20 [431], PrataAN23 [509], PovedaAA23 [508], Adolgren2023 [7], EtmianiesfahanGNMS22 [202], ElciOH22 [195], ZarandiASC20 [654], HauderBRPA20 [283], abs-1902-09244 [282], Hooker19 [312], LaborieRSV18 [372], HookerH17 [314], TranAB16 [594], Lombardi10 [388], Laborie09 [370], KovacsB08 [355], KroggLPJ07 [608], MartinPY01 [427], SimonisCK00 [560], CruianK98 [264], Darby-DowmanLMZ97 [163], Wallace96 [625], Simonis95 [557], Simonis95 [561], PovedaAA23 [509], NaderiRR23 [460], CzerniachowskaWZ23 [159], NaderiBZ22 [452], NaderiBZ22a [452], AntuoriHHEN21 [22], HubnerGSV21 [318], AlbornAPMV21 [166], KoehlerBFFHPSS21 [348], VIKH121 [623], BarzegaranP20 [61], GebingerMM19 [236], abs-1911-04766 [235], BonfiettoZLM16 [113], Salai15a [552], SchmeHH15 [533], AlbornNDC14 [131], HarjunoskiMBC14 [279], BeniniBGM06 [83], KovacsV00 [369], Wallace96 [625]
ApplicationAreas	automotive	GuoZ23 [269], YuraszekMPV22 [650], EmdeZD22 [199], Grolenz21 [261], LintanyakiS12 [303], SunLYL10 [567], Lombardi10 [388], BarriatCG08 [52], SchildW00 [532]		
ApplicationAreas	cable tree	KoehlerBFFHPSS21 [348]	AntuoriHHEN21 [22]	BoldiceanuC94 [78], abs-2312-13682 [407], PerezGSL23 [498], TonatiT22 [522], CauwelaertDS20 [142], WallaceY23 [627], ZarandiASC20 [654], FallahiAC20 [209], Hooker19 [312], CauwelaertDMS16 [130], Dejemeppe16 [172], DejemeppeOS15 [173], NovasH12 [476], CorreaR07 [158], LimRX04 [389]
ApplicationAreas	car manufacturing			
ApplicationAreas	container terminal	QinDCS20 [512], SacramentoSP20 [526]	LaborieRSV18 [372]	NaderiBZ22 [452], WangB23 [629], Adolgren2023 [7], EtmianiesfahanGNMS22 [202], NaderiBZ22a [452], NaderiBZ22 [452], HojnNVH22 [295], ElciOH22 [195], Molin21 [531], MokhtarzadehTFV20 [443], TangLW-SK18 [672], HookerH17 [314], DouhalRP16 [190], LipowetzkyBPS14 [352], HachemiGR11 [272], MilanoW09 [441], WaB09 [643], MilanoW06 [440], BoldiceanuC02 [79], JainG01 [523], SimonisCK00 [560]
ApplicationAreas	crew-scheduling	ZarandiASC20 [654], PourDERB18 [505]	BourreauGGL12 [118], Zahout21 [652], GomolayWS18 [253], Mason01 [429], Touraivane95 [593]	Bartak02 [54], Bartak02a [53], Grolenz21 [261], Zahout21 [652], GalleguillosKSB19 [225], Madri-WambaLOBM17 [418], Letort13 [352], IfrimOS12 [520], LetortBC12 [383]
ApplicationAreas	dairies			
ApplicationAreas	dairy	EscobetPQPA19 [201]	PrataAN23 [509], HarjunoskiMBC14 [279]	
ApplicationAreas	datacenter	HermenierDL11 [300]		
ApplicationAreas	datacentre		HurleyOS16 [319]	
ApplicationAreas	day-ahead market			
ApplicationAreas	deep space			
ApplicationAreas	drone	MontemanniD23a [440], MontemanniD23 [447], Ham18 [273]		HebrardALLCMR22 [285], GuoZ23 [269], JuvinHL23a [331], Adolgren2023 [7], ShaikhK23 [547], EmdeZD22 [199], Astrand21 [35], AstrandOF21 [36], AntuoriHHEN21 [22], ZarandiASC20 [654], Ham18a [274]

# Prolific Authors



Table 8: Co-Authors of Articles/Papers

Author	Nr Works	Nr Cites	Entries
J. Christopher Beck	49	701	<a href="#">LuoB322</a> [416], <a href="#">ZhangBB22</a> [658], <a href="#">TangB20</a> [573], <a href="#">RoshanaeiBAUB20</a> [521], <a href="#">TranPZLDB18</a> [597], <a href="#">TranVNB17</a> [599], <a href="#">TranVNB17a</a> [600], <a href="#">CohenHB17</a> [154], <a href="#">BoothNB16</a> [114], <a href="#">KuB16</a> [365], <a href="#">TranAB16</a> [594], <a href="#">TranWDRFOVB16</a> [601], <a href="#">LuoVLMB16</a> [415], <a href="#">TranDRFWOVVB16</a> [596], <a href="#">BajestaniB15</a> [43], <a href="#">KoschB14</a> [553], <a href="#">TerekhovVB14</a> [581], <a href="#">LomteNB14</a> [312], <a href="#">HeinzSB13</a> [294], <a href="#">HeinzKB13</a> [291], <a href="#">BajestaniB13</a> [42], <a href="#">TranIDB13</a> [598], <a href="#">HeinzB12</a> [290], <a href="#">TerekhovIDB12</a> [580], <a href="#">TranB12</a> [595], <a href="#">ZarandiB12</a> [219], <a href="#">KovacsB11</a> [356], <a href="#">BeckFW11</a> [69], <a href="#">BeckmanB11</a> [259], <a href="#">BajestaniB11</a> [41], <a href="#">WuB09</a> [643], <a href="#">BidotVLB09</a> [94], <a href="#">CarchraeB09</a> [131], <a href="#">WatsonB08</a> [632], <a href="#">KovacsB08</a> [355], <a href="#">BeckW07</a> [73], <a href="#">Beck07</a> [64], <a href="#">KovacsB07</a> [354], <a href="#">Beck06</a> [63], <a href="#">CarchraeB05</a> [132], <a href="#">WuB05</a> [642], <a href="#">BeckW05</a> [72], <a href="#">BeckW04</a> [71], <a href="#">BeckR03</a> [70], <a href="#">BeckPS03</a> [69], <a href="#">BeckF00</a> [68], <a href="#">Beck99</a> [62], <a href="#">BeckF98</a> [67], <a href="#">BeckDF97</a> [65]
Michela Milano	31	297	<a href="#">BorghesiBLMB18</a> [115], <a href="#">BonfiettiZLM16</a> [113], <a href="#">BridiBLMB16</a> [120], <a href="#">BridiLBBM16</a> [121], <a href="#">LombardiBM15</a> [399], <a href="#">BartoliniBBLM14</a> [60], <a href="#">BonfiettiLM14</a> [111], <a href="#">BonfiettiLBM14</a> [109], <a href="#">BonfiettiLM13</a> [110], <a href="#">LombardiBM13</a> [406], <a href="#">LombardiMB13</a> [407], <a href="#">LombardiM12</a> [403], <a href="#">BonfiettiLM12</a> [108], <a href="#">LombardiM12a</a> [404], <a href="#">BonfiettiM12</a> [112], <a href="#">BonfiettiLBM11</a> [107], <a href="#">LombardiBMB11</a> [409], <a href="#">BeniniLMR11</a> [90], <a href="#">MilanoI</a> [438], <a href="#">LombardiM10</a> [403], <a href="#">LombardiM10a</a> [402], <a href="#">LombardiMRB10</a> [408], <a href="#">LombardiM09</a> [401], <a href="#">RuggieroBBMA09</a> [525], <a href="#">MilanoW09</a> [441], <a href="#">BeniniLMR08</a> [89], <a href="#">BeniniBGM06</a> [88], <a href="#">MilanoW06</a> [440], <a href="#">MilanoORT02</a> [439], <a href="#">LammaMM07</a> [377], <a href="#">BrusoniCLMMT96</a> [123]
Andreas Schutt	27	322	<a href="#">YangSS19</a> [644], <a href="#">KreterSSZ18</a> [364], <a href="#">GoldwasserS18</a> [251], <a href="#">MuslinSS18</a> [455], <a href="#">KreterSS17</a> [363], <a href="#">YoungFS17</a> [646], <a href="#">GoldwasserS17</a> [250], <a href="#">SchuttS16</a> [543], <a href="#">SzorodiS16</a> [570], <a href="#">KreterSS15</a> [362], <a href="#">EvensSH15</a> [203], <a href="#">EvensSH15a</a> [204], <a href="#">SchuttFSW15</a> [542], <a href="#">ThiruvadyWGS14</a> [585], <a href="#">GuSSWC14</a> [266], <a href="#">SchuttFPS13</a> [537], <a href="#">SchuttFS13a</a> [539], <a href="#">GuSS13</a> [265], <a href="#">SchuttFSW13</a> [541], <a href="#">ChirGNSW13</a> [147], <a href="#">SchuttCSW12</a> [535], <a href="#">SchuttFSW11</a> [540], <a href="#">Schutt11</a> [534], <a href="#">SchuttW10</a> [544], <a href="#">abs-1009-0347</a> [539], <a href="#">SchuttFSW09</a> [538], <a href="#">SchuttWS05</a> [545]
Michele Lombardi	25	194	<a href="#">BorghesiBLMB18</a> [115], <a href="#">CauwelaertLS18</a> [141], <a href="#">BonfiettiZLM16</a> [113], <a href="#">BridiBLMB16</a> [120], <a href="#">BridiLBBM16</a> [121], <a href="#">LombardiBM15</a> [399], <a href="#">BartoliniBLM14</a> [60], <a href="#">BonfiettiLM14</a> [111], <a href="#">BonfiettiLBM14</a> [109], <a href="#">BonfiettiLM13</a> [110], <a href="#">LombardiM13</a> [406], <a href="#">LombardiMB13</a> [407], <a href="#">LombardiM12</a> [405], <a href="#">BonfiettiLBM12</a> [108], <a href="#">LombardiM12a</a> [404], <a href="#">BonfiettiLBM11</a> [107], <a href="#">LombardiBMB11</a> [409], <a href="#">BeniniLMR11</a> [90], <a href="#">LombardiM10</a> [403], <a href="#">LombardiM10a</a> [402], <a href="#">Lombardi10</a> [398], <a href="#">LombardiMRB10</a> [408], <a href="#">LombardiM09</a> [401], <a href="#">BeniniLMR08</a> [89], <a href="#">HoeevGSL07</a> [229]
Peter J. Stuckey	24	453	<a href="#">YangSS19</a> [644], <a href="#">DemirovicS18</a> [117], <a href="#">KreterSSZ18</a> [364], <a href="#">MuslinSS18</a> [455], <a href="#">KreterSS17</a> [363], <a href="#">SchuttS16</a> [543], <a href="#">BlomPS16</a> [100], <a href="#">KreterSS15</a> [362], <a href="#">BurtLPS15</a> [124], <a href="#">SchuttFSW15</a> [542], <a href="#">BlomBPS14</a> [99], <a href="#">LipovetzkyBPS14</a> [304], <a href="#">GuSSWC14</a> [266], <a href="#">SchuttFPS13</a> [537], <a href="#">SchuttFS13a</a> [539], <a href="#">GuSS13</a> [265], <a href="#">SchuttFSW13</a> [541], <a href="#">SchuttCSW12</a> [535], <a href="#">GuSW12</a> [267], <a href="#">SchuttFSW11</a> [540], <a href="#">BandaSC11</a> [170], <a href="#">abs-1009-0347</a> [539], <a href="#">SchuttFSW09</a> [538], <a href="#">OhrimenkoSC09</a> [483]
John N. Hooker	19	1316	<a href="#">EickOH22</a> [195], <a href="#">Hooker19</a> [312], <a href="#">Hooker17</a> [311], <a href="#">HookerH17</a> [314], <a href="#">HechingH16</a> [288], <a href="#">CircCH16</a> [130], <a href="#">HarjunkoskiMBC14</a> [279], <a href="#">CircCH13</a> [149], <a href="#">CobanH11</a> [153], <a href="#">CobanH10</a> [152], <a href="#">Hooker10</a> [310], <a href="#">Hooker07</a> [309], <a href="#">Hooker06</a> [308], <a href="#">Hooker05</a> [306], <a href="#">Hooker05a</a> [307], <a href="#">Hooker04</a> [305], <a href="#">Hooker003</a> [313], <a href="#">HookerY02</a> [315], <a href="#">Hooker00</a> [304]
Emmanuel Hebrard	17	71	<a href="#">JuvinHHL23</a> [328], <a href="#">HebrardALLCMR22</a> [285], <a href="#">AntuoriHHEN21</a> [22], <a href="#">ArtiguesHQT21</a> [32], <a href="#">GodetLH20</a> [247], <a href="#">AntuoriHHEN20</a> [21], <a href="#">HebrardHJMPV16</a> [280], <a href="#">SimoninAHL15</a> [555], <a href="#">SialaAH15</a> [553], <a href="#">GrimesH15</a> [258], <a href="#">BessiereHMqw14</a> [93], <a href="#">SimoninAHL12</a> [554], <a href="#">BillautHL12</a> [95], <a href="#">GrimesH11</a> [257], <a href="#">GrimesH10</a> [256], <a href="#">GrimesHM09</a> [259], <a href="#">HebrardTW05</a> [287]
Pierre Lopez	17	90	<a href="#">JuvinHHL23</a> [328], <a href="#">JuvinHHL23a</a> [331], <a href="#">JuvinHHL23</a> [330], <a href="#">HebrardALLCMR22</a> [285], <a href="#">JuvinHL22</a> [329], <a href="#">Polo-MejiaALB20</a> [503], <a href="#">NattaHFKAL19</a> [466], <a href="#">NattaAL17</a> [463], <a href="#">NattaALR16</a> [464], <a href="#">SimoninAHL15</a> [555], <a href="#">NattaAL15</a> [462], <a href="#">SimoninAHL12</a> [554], <a href="#">BillautHL12</a> [95], <a href="#">LahimerLH11</a> [375], <a href="#">TrojetHL11</a> [602], <a href="#">LopezAKYG00</a> [410], <a href="#">TorresL00</a> [591]
Christian Artigues	16	203	<a href="#">PovedaAA23</a> [506], <a href="#">PohAR22</a> [502], <a href="#">HebrardALLCMR22</a> [285], <a href="#">ArtiguesHQT21</a> [32], <a href="#">Polo-MejiaALB20</a> [503], <a href="#">NattaHFKAL19</a> [466], <a href="#">NattaAL17</a> [463], <a href="#">NattaALR16</a> [464], <a href="#">SimoninAHL15</a> [555], <a href="#">NattaAL15</a> [462], <a href="#">SialaAH15</a> [553], <a href="#">SimoninAHL12</a> [554], <a href="#">NeronABCD06</a> [481], <a href="#">DemassevAM05</a> [176], <a href="#">ArtiguesBF04</a> [30], <a href="#">ArtiguesR00</a> [33]
Pierre Schaus	15	79	<a href="#">CauwelaertLS20</a> [142], <a href="#">LlomesKS20</a> [289], <a href="#">HonnardBSW19</a> [316], <a href="#">CappartTSR18</a> [139], <a href="#">CauwelaertLS18</a> [141], <a href="#">CappartS17</a> [129], <a href="#">CauwelaertDMS16</a> [140], <a href="#">DejemeppeCS15</a> [173], <a href="#">GayHS15</a> [239], <a href="#">GayHS15a</a> [231], <a href="#">HonnardjISWD14</a> [317], <a href="#">GaySS14</a> [232], <a href="#">SchausHMCMD11</a> [531], <a href="#">SchausD08</a> [530]
Helmut Simonis	15	154	<a href="#">ArmstrongGOS22</a> [27], <a href="#">ArmstrongGOS21</a> [26], <a href="#">AntunesABD20</a> [20], <a href="#">AntunesABD18</a> [19], <a href="#">HurleyOS16</a> [319], <a href="#">GrimesOS14</a> [260], <a href="#">IfrimOS12</a> [320], <a href="#">SimonisH11</a> [562], <a href="#">Simonis07</a> [559], <a href="#">SimonisCK00</a> [569], <a href="#">Simonis99</a> [558], <a href="#">SimonisC95</a> [561], <a href="#">Simonis95</a> [557], <a href="#">Simonis95a</a> [556], <a href="#">DincbasSH90</a> [184], <a href="#">Madé-WambasLOBM17</a> [178], <a href="#">Madé-WambasB15</a> [617], <a href="#">LatorOB15</a> [389], <a href="#">LatorOB13</a> [384], <a href="#">LatorBC12</a> [383], <a href="#">CiercoP311</a> [151], <a href="#">BeldiceanuCDP11</a> [80], <a href="#">BeldiceanuP08</a> [81], <a href="#">FoderBos</a> [504], <a href="#">BeldiceanuP07</a> [82], <a href="#">FoderBS04</a> [501], <a href="#">Beldiceanu02</a> [79], <a href="#">Aggoun93</a> [9]
Luca Benini	13	146	<a href="#">BorghesiBLMB18</a> [115], <a href="#">BridiBLMB16</a> [120], <a href="#">BridiLBBM16</a> [121], <a href="#">BonfiettiLBM14</a> [109], <a href="#">LombardiMB13</a> [407], <a href="#">BonfiettiLBM12</a> [108], <a href="#">BonfiettiLBM11</a> [107], <a href="#">LombardiBMB11</a> [409], <a href="#">BeniniLMR11</a> [90], <a href="#">LombardiMRB10</a> [408], <a href="#">RuggieroBBMA09</a> [525], <a href="#">BeniniLMR08</a> [89], <a href="#">BeniniBGM06</a> [88], <a href="#">LunardiBLRV20</a> [413], <a href="#">LaborieRSV18</a> [372], <a href="#">LaborieLSa</a> [371], <a href="#">MeigarejoLS15</a> [11], <a href="#">VilimLS15</a> [621], <a href="#">Laborie09</a> [370], <a href="#">BidotVLB09</a> [94], <a href="#">BaptisteLPN06</a> [47], <a href="#">NeronABCD06</a> [481], <a href="#">GodardLN05</a> [245], <a href="#">Laborie03</a> [369], <a href="#">FocacciLN00</a> [215]
Philippe Laborie	12	513	<a href="#">BaptisteB18</a> [46], <a href="#">Baptiste09</a> [45], <a href="#">BaptisteLPN06</a> [47], <a href="#">NeronABCD06</a> [481], <a href="#">ArtouchineB05</a> [34], <a href="#">Baptiste02</a> [44], <a href="#">BaptistePN01</a> [59], <a href="#">BaptisteP00</a> [49], <a href="#">PapaB08</a> [492], <a href="#">BaptisteP07</a> [48], <a href="#">PapeB07</a> [491]
Philippe Baptiste	11	403	<a href="#">SvancaraB22</a> [599], <a href="#">JelinekB16</a> [325], <a href="#">BartakY15</a> [59], <a href="#">Bartak14</a> [55], <a href="#">BartakS11</a> [57], <a href="#">BartakCS10</a> [56], <a href="#">BartakSR10</a> [58], <a href="#">VilimBC05</a> [620], <a href="#">VilimBC04</a> [619], <a href="#">Bartak02</a> [54], <a href="#">Bartak02a</a> [53]
Roman Barták	11	88	

# Limitations



- Limited coverage by OpenCitations
- Difficult to have local access to some publication types (book, incollection)
- Heavily biased towards publications in English
- More powerful NLP analysis of works possible?



# Problem: Count for Most Cited Papers



Table 9: Works from bibtex (Total 30)

Key	Authors	Title	LC	Cite	Year	Conference / Journal	Pages	Nr Cites	Nr Refs	b	c
JainM99	JainM99	A. Jain, S. Meeran	Yes	322	1999	European Journal of Operational Research	45	490	150	1352	1753
HarjunkskiMBC14	HarjunkskiMBC14	T. Harjunkski, Christos T. Maravelias, P. Bongers, Pedro M. Castro, S. Engel, Ignacio E. Grossmann, John N. Hooker, C. Méndez, G. Sand, J. Wastick	Yes	279	2014	Computers Chemical Engineering	33	381	176	1335	1649
BlazewiczDP96	BlazewiczDP96	J. Blazewicz, W. Domschke, E. Pesch	Yes	125	1996	European Journal of Operational Research	33	344	127	1278	1762
Hooker03	Hooker03	John N. Hooker, G. Ottoson	Yes	313	2003	Mathematical Programming	28	317	0	1347	1729
BaptistePN01	BaptistePN01	P. Baptiste, Claude Le Pape, W. Nuijten	No	50	2001	Book	null	296	0	No	n/a
JainG01	JainG01	V. Jain, Ignacio E. Grossmann	Yes	323	2001	INFORMS Journal on Computing	19	279	23	1351	1738
AggounB93	AggounB93	A. Aggoun, N. Beldiceanu	Yes	9	1993	Mathematical and Computer Modelling	17	187	11	1247	1767
Hooker00	Hooker00	John N. Hooker	No	304	2000	Book	null	185	0	No	n/a
Hooker07	Hooker07	John N. Hooker	Yes	399	2007	Operations Research	29	181	19	1345	1715
HarjunkskiG02	HarjunkskiG02	T. Harjunkski, Ignacio E. Grossmann	Yes	278	2002	Computers Chemical Engineering	20	169	11	1334	1733
BeldiceanuC94	BeldiceanuC94	N. Beldiceanu, E. Contesjean	Yes	75	1994	Mathematical and Computer Modelling	27	167	8	1271	1765
LaborieRSV18	LaborieRSV18	P. Laborie, J. Rogerie, P. Shaw, P. Vilfin	Yes	372	2018	Constraints An Int. J.	41	148	35	1370	1610
Laborie03	Laborie03	P. Laborie	Yes	369	2003	Artificial Intelligence	38	128	10	1369	1731
OhrimenkoSC09	OhrimenkoSC09	O. Ohrimenko, Peter J. Stuckey, M. Godish	Yes	483	2009	Constraints An Int. J.	35	127	15	1417	1702
KuB16	KuB16	W. Ku, J. Christopher Beck	Yes	365	2016	Computers Operations Research	9	119	17	1367	1630
Rodriguez07	Rodriguez07	J. Rodriguez	Yes	520	2007	Transportation Research Part B: Methodological	15	117	6	1430	1716
LiWos	LiWos	H. Li, K. Womer	Yes	380	2008	Journal of Scheduling	18	113	31	1374	1708
CorreaLR07	CorreaLR07	Ayoub Insa Corréa, A. Langevin, L. Rousseau	Yes	158	2007	Computers Operations Research	20	106	20	1296	1714
MengZRRZL20	MengZRRZL20	L. Meng, C. Zhang, Y. Ren, B. Zhang, C. Lv	Yes	435	2020	Computers Industrial Engineering	13	100	62	1393	1574
BensanaLV99	BensanaLV99	E. Bensana, M. Lemaître, G. Verfaillie	Yes	91	1999	Constraints An Int. J.	7	99	0	1276	1752

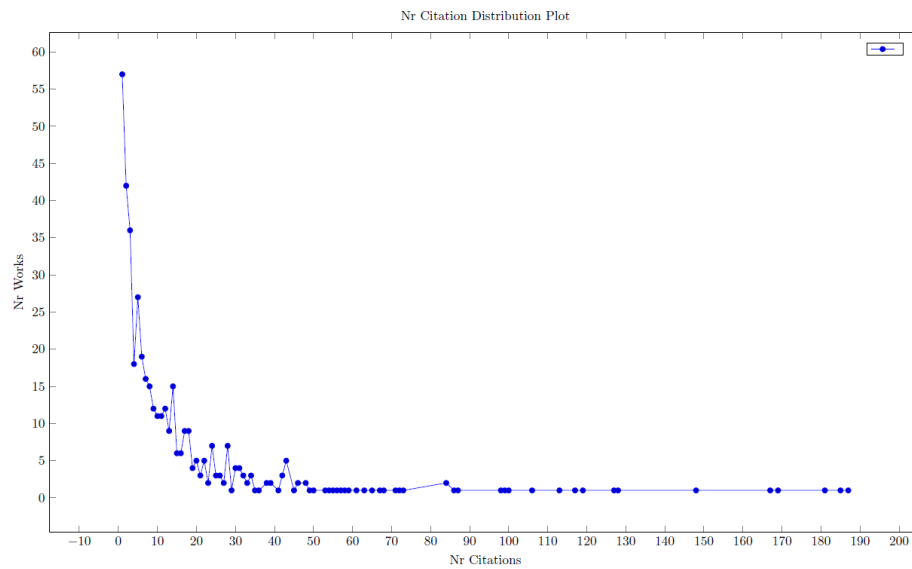
## OpenCitation Count Compared to Google Scholar



Key	Type	Google	OC	Ratio
JainM99	article	1116	490	2.28
HarjunkskiMBC14	article	588	381	1.54
BlazewiczDP96	article	796	344	2.31
BaptistePN01	book	1039	296	3.51
AggounB93	article	502	187	2.68
LaborieRSV18	article	309	148	2.09
BensanaLV99	article	251	99	2.54
DincbasSH90	article	271	86	3.15
Thorsteinsson01	paper	205	67	3.06
DincbasSH88	paper	287	0	☹



# Problem: Citation Count Distribution



## Summary



- Use the survey to find
  - Most important works on Constraint Based Scheduling
  - Specialized papers on the constraint reasoning for scheduling
  - Works in specific application domains or specific industries