Table 3: Characterization of 194 experiments with DNNs

Step	Aspect	Full	Partial	Missing
Hypotheses formulation	Research hypotheses	**76%**	0%	24%
Variables identification	Model hyperparameters	7%	**85%**	8%
	Model parameters	2%	0%	**98%**
	DL algorithm	26%	**72%**	2%
	Training hyperparameters	19%	**73%**	8%
	Training data	**69%**	27%	4%
Operationalization	Factors and treatments	14%	**82%**	4%
	Response variables	**76%**	18%	6%
Design	Choice of design	0%	**70%**	30%
	Instrumentation	2%	**97%**	1%
Objects selection	Test set characteristics	**59%**	19%	22%
Analysis & interpretation	Descriptive statistics	10%	34%	**56%**
	Inferential statistics	12%	1%	**87%**
Validity evaluation	Validity threats	2%	**79%**	19%

Characterization criteria

Step	Aspect	Fully addressed	Partially addressed	Missing
Hypotheses formulation	Research hypotheses	Present	-	Missing
Variables identification	Model hyperparameters	All described/linked to artefact	Some described/linked to artefact	All missing
	Model parameters	Described/linked to artefact	-	Missing
	DL algorithm	All described/linked to artefact	Some described/linked to artefact	All missing
	Training hyperparameters	All described/linked to artefact	Some described/linked to artefact	All missing
	Training data	All datasets linked to artefact	Some linked to artefact/others described	None linked and/or desribed
Operationalization	Factors and treatments	Both described	Factors described only	None described
	Response variables	Formula/units (e.g. percentage of test cases passed)	Metric (e.g. effectiveness, reliability)	Aspect measured (e.g. quality)
Design	Choice of design	All sources of randomness taken into consideration	Classical sources of randomness considered	No sources of randomness considered
	Instrumentation	All elements described (test set, measuring instruments, measurement procedure and technological infrastructure)	Elements partially described or some of them not described	All missing
Objects selection	Datasets characteristics	Specific characteristics of the elements in the dataset are provided	General description of the dataset (not elements) is given	Only reference to dataset
Analysis & interpretation	Descriptive statistics	Centrality and dispersion for all variables	Centrality and/or dispersion for all/some variables	None
	Inferential statistics	All variables are analyzed	Some variables analyzed	No variables analyzed
Validity evaluation	conclusion/internal/construct/external	All categories covered	Some categories covered or listing of threats that cannot be mapped to category	No validity threats

Summary of characterization: All papers

EXPERIMENTS: 194

	Hypotheses	Variables identification					Operationalization		Design		Population	Analysis		Validity evaluation
	Research	Model hyperparameters	Model parameters	DL algorithm	Training hyperparameters	Training data	Factors and treatments	Response variables	Choice of design	Instrumentation	Test dataset	Descriptive statistics	Inferential statistics	Validity evaluation
COUNT M:	47	15	190	5	16	7	8	12	58	2	42	109	169	38
COUNT PA:	0	166	0	139	142	52	158	34	136	189	38	66	1	153
COUNT FA	147	13	4	50	36	135	28	148	0	3	114	19	24	3
% M	24%	8%	98%	3%	8%	4%	4%	6%	30%	1%	22%	56%	87%	20%
% PA	0%	86%	0%	72%	73%	27%	81%	18%	70%	97%	20%	34%	1%	79%
% FA	76%	7%	2%	26%	19%	70%	14%	76%	0%	2%	59%	10%	12%	2%
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Characterization of ICSE papers

Venue	Paper #	Experiment	Hypotheses	Variables identification					Operationalization		Design		Population	Analysis		Validity evaluation	Artifact	
			Research	Model hyperparameters	Model parameters	DL algorithm	Training hyperparameters	Training data	Factors and treatments	Response variables	Choice of design	Instrumentation	Test dataset	Descriptive statistics	Inferential statistics		Availability	Badge
ICSE'18	AP1	E1	M	PA	M	PA	PA	FA	M	M	M	PA	PA	M	M	M	Yes	No
		E2	M	PA	M	PA	PA	FA	PA	FA	PA	PA	PA	M	M	M		
		E3	M	PA	M	PA	PA	FA	M	FA	M	PA	PA	PA	M	M		
		E4	M	PA	M	PA	PA	FA	PA	FA	PA	PA	PA	PA	FA	M		
ICSE'18	AP2	E1	M	PA	M	PA	PA	FA	PA	FA	M	PA	FA	PA	PA	PA	Yes	No
ICSE'19	AP3	E1	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA	Yes	No
		E2	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E3	FA	PA	M	PA	PA	FA	PA	FA	M	PA	FA	M	M	PA		
ICSE'19	AP4	E1	M	PA	M	PA	PA	FA	FA	PA	M	PA	FA	M	M	PA	Yes	No
		E2	FA	PA	M	PA	PA	FA	PA	FA	M	PA	FA	M	M	PA		
ICSE'19	AP5	E1	FA	PA	M	PA	PA	PA	PA	FA	M	PA	M	M	M	M	Yes	Available Reusable
		E2	FA	PA	M	PA	PA	PA	PA	FA	PA	PA	M	M	M	M		
		E3	FA	PA	M	PA	PA	PA	PA	FA	PA	PA	M	M	M	M		
		E4	FA	PA	M	PA	PA	PA	M	FA	PA	PA	M	M	M	M		
ICSE'19	AP6	E1	FA	PA	M	PA	PA	FA	FA	FA	PA	PA	FA	PA	M	M	No	No
		E2	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	FA	M	M		
		E3	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	FA	M	M		
		E4	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	FA	M	M		
		E5	FA	M	M	M	M	M	PA	PA	M	PA	M	M	M	M		
ICSE'19	AP7	E1	M	PA	M	PA	PA	PA	FA	M	M	PA	M	M	M	PA	Yes	No
		E2	FA	PA	M	PA	PA	PA	PA	PA	PA	PA	M	M	M	PA		
		E3	FA	PA	M	PA	PA	PA	PA	FA	PA	PA	M	M	M	PA		
ICSE'19	AP8	E1	FA	PA	FA	PA	FA	FA	PA	FA	M	PA	PA	M	M	PA	Yes	Available
		E2	FA	PA	FA	PA	FA	FA	PA	FA	M	PA	PA	M	M	PA		
		E3	FA	PA	FA	PA	FA	FA	PA	FA	M	PA	PA	M	M	PA		
		E4	FA	PA	FA	PA	FA	FA	PA	FA	M	PA	PA	M	M	PA		
ICSE'19	AP9	E1	FA	PA	M	PA	PA	FA	PA	PA	M	PA	PA	M	M	PA	Yes	No
		E2	FA	PA	M	PA	PA	FA	PA	PA	M	PA	PA	M	M	PA		
ICSE'19	AP10	E1	M	PA	M	PA	PA	FA	PA	M	PA	PA	PA	M	M	PA	Yes	Available
		E2	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	PA	FA	FA	PA		
		E3	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	PA	FA	M	PA		
		E4	FA	PA	M	PA	PA	FA	FA	FA	PA	PA	PA	FA	M	PA		
ICSE'20	AP11	E1	M	PA	M	PA	PA	FA	PA	PA	M	PA	FA	M	FA	M	Yes	No
		E2	M	PA	M	PA	PA	FA	PA	FA	M	PA	FA	FA	FA	M		
ICSE'20	AP12	E1	M	PA	M	PA	M	PA	PA	FA	PA	PA	M	M	M	PA	Yes	No
		E2	M	PA	M	PA	M	PA	PA	FA	PA	PA	FA	M	M	PA		
		E3	M	PA	M	PA	M	PA	PA	FA	PA	PA	FA	M	M	PA		
		E4	M	PA	M	PA	M	PA	PA	FA	PA	PA	FA	M	M	PA		
ICSE'20	AP13	E1	M	PA	M	PA	PA	FA	FA	FA	PA	PA	FA	PA	M	PA	Yes	No
		E2	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	PA	M	PA		
		E3	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	PA	M	PA		
		E4	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	PA	M	PA		
		E5	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	PA	M	PA		
ICSE'20	AP14	E1	M	M	M	PA	PA	FA	FA	FA	PA	PA	M	M	M	PA	Yes	No
		E2	FA	M	M	PA	PA	FA	PA	FA	PA	PA	M	M	M	PA		
		E3	FA	M	M	PA	PA	FA	PA	FA	M	PA	M	M	M	PA		
ICSE'20	AP15	E1	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	M	PA	M	PA	Yes	Available
		E2	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	M	PA	M	PA		
		E3	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	M	PA	M	PA		
ICSE'20	AP16	E1	M	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA	Yes	No
		E2	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E3	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E4	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E5	M	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	PA	FA	PA		
ICSE'20	AP17	E1	FA	PA	M	FA	PA	FA	FA	FA	M	PA	PA	M	M	PA	Yes	No
		E2	FA	PA	M	PA	PA	FA	PA	PA	PA	PA	PA	M	M	PA		
		E3	FA	PA	M	FA	PA	FA	PA	FA	PA	PA	PA	M	M	PA		
ICSE'21	AP18	E1	FA	PA	M	FA	PA	FA	PA	FA	PA	PA	FA	PA	M	PA	Yes	No
ICSE'21	AP19	E1	FA	M	M	PA	M	M	PA	FA	PA	PA	FA	PA	M	PA	Yes	No

Characterization of ICSE papers

| Venue | Paper # | Experiment | Hypotheses | Variables identification | | | | | Operationalization | | Design | | Population | Analysis | | Validity | Artifact | |
			Research	Model hyperparameters	Model parameters	DL algorithm	Training hyperparameters	Training data	Factors and treatments	Response variables	Choice of design	Instrumentation	Test dataset	Descriptive statistics	Inferential statistics	evaluation	Availability	Badge
ICSE'21	AP20	E1	M	PA	M	FA	FA	PA	FA	M	M	PA	M	M	M	PA		
		E2	FA	PA	M	FA	FA	PA	PA	FA	PA	PA	M	PA	M	PA	Yes	No
		E3	FA	PA	M	FA	FA	PA	PA	FA	PA	PA	M	PA	M	PA		
ICSE'21	AP21	E1	FA	PA	M	PA	FA	PA	PA	FA	M	PA	M	M	M	M	Yes	No
ICSE'21	AP22	E1	M	PA	M	PA	FA	FA	FA	M	PA	PA	FA	M	M	PA		
		E2	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E3	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA	Yes	No
		E4	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E5	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
ICSE'21	AP24	E1	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E2	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E3	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA	Yes	No
		E4	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E5	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E6	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
ICSE'21	AP23	E1	FA	PA	M	PA	PA	PA	PA	FA	PA	PA	M	PA	M	PA		
		E2	FA	PA	M	PA	PA	PA	PA	FA	PA	PA	M	PA	M	PA	Yes	No
		E3	FA	PA	M	PA	PA	PA	PA	FA	PA	PA	M	PA	M	PA		
		E4	M	PA	M	PA	PA	PA	PA	PA	PA	PA	M	PA	M	PA		

EXPERIMENTS: 78

COUNT M:	21	5	74	1	6	2	3	5	21	0	23	50	72	16
COUNT PA:	0	73	0	70	63	19	66	8	57	78	17	21	1	62
COUNT FA	57	0	4	7	9	57	9	65	0	0	38	7	5	0

% M	27%	6%	95%	1%	8%	3%	4%	6%	27%	0%	29%	64%	92%	21%
% PA	0%	94%	0%	90%	81%	24%	85%	10%	73%	100%	22%	27%	1%	79%
% FA	73%	0%	5%	9%	12%	73%	12%	83%	0%	0%	49%	9%	6%	0%
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Characterization of ESEC/FSE papers

Venue	Paper #	Experiment	Hypotheses		Variables identification					Operationalization		Design		Population	Analysis		Validity evaluation	Artifact	
			Research	Statistical	Model hyperparameters	Model parameters	DL algorithm	Training hyperparameters	Training data	Factors and treatments	Response variables	Choice of design	Instrumentation	Test dataset	Descriptive statistics	Inferential statistics		Availability	Badge
FSE'18	AP25	E1	M	M	PA	M	FA	PA	FA	M	PA	PA	PA	FA	M	M	M	Yes	No
		E2	M	M	PA	M	FA	PA	FA	PA	PA	PA	PA	FA	PA	M	M		
		E3	M	M	PA	M	FA	PA	FA	PA	PA	PA	PA	FA	PA	M	M		
FSE'18	AP26	E1	M	M	PA	M	FA	PA	PA	M	PA	M	PA	PA	M	M	M	Yes	No
		E2	M	M	PA	M	FA	PA	PA	PA	FA	M	PA	PA	M	M	M		
		E3	M	M	PA	M	FA	PA	PA	PA	FA	M	PA	PA	M	M	M		
		E4	M	M	PA	M	FA	PA	PA	PA	PA	M	PA	PA	M	M	M		
FSE'18	AP27	E1	FA	M	PA	M	PA	PA	PA	PA	PA	M	PA	M	M	M	PA	No	No
FSE'18	AP28	E1	FA	M	PA	M	PA	PA	PA	PA	FA	M	PA	PA	M	M	PA	No	No
		E2	FA	M	PA	M	PA	PA	PA	PA	FA	M	PA	PA	PA	M	PA		
		E3	FA	M	PA	M	PA	PA	PA	PA	FA	M	PA	PA	M	M	PA		
FSE'19	AP29	E1	FA	M	PA	M	PA	PA	FA	PA	PA	PA	PA	PA	PA	M	PA	Yes	Yes
FSE'19	AP30	E1	M	M	PA	M	PA	M	PA	PA	M	M	PA	M	M	M	PA	No	No
		E2	FA	M	PA	M	PA	M	PA	PA	PA	PA	PA	M	FA	M	PA		
		E3	FA	M	PA	M	PA	M	M	PA	FA	PA	PA	M	PA	M	PA		
FSE'19	AP31	E1	FA	M	PA	M	FA	PA	PA	PA	FA	PA	PA	FA	M	M	PA	No	No
		E2	FA	M	PA	M	FA	PA	PA	PA	FA	PA	PA	FA	M	M	PA		
FSE'19	AP32	E1	FA	M	PA	M	M	M	FA	PA	PA	PA	PA	FA	PA	FA	PA	Yes	No
		E2	FA	M	PA	M	M	M	FA	PA	PA	PA	PA	FA	PA	FA	PA		
		E3	FA	M	PA	M	M	M	FA	PA	PA	PA	PA	FA	PA	FA	PA		
FSE'20	AP33	E1	FA	M	PA	M	PA	PA	PA	PA	FA	PA	PA	PA	M	M	M	Yes	No
		E2	FA	M	PA	M	PA	PA	PA	PA	FA	PA	PA	PA	M	M	M		
		E3	FA	M	PA	M	PA	PA	M	PA	FA	M	PA	M	M	M	M		
FSE'20	AP34	E1	M	M	PA	M	PA	PA	M	PA	PA	PA	PA	PA	M	M	M	No	No
		E2	M	M	PA	M	PA	PA	M	PA	PA	M	PA	PA	M	M	M		
FSE'20	AP35	E1	M	M	PA	M	PA	PA	FA	M	M	M	PA	M	M	M	PA	Yes	No
		E2	M	M	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	PA	FA	PA		
FSE'20	AP36	E1	FA	M	PA	M	PA	PA	FA	PA	FA	PA	FA	PA	PA	M	PA	Yes	Yes
		E2	FA	M	PA	M	PA	PA	FA	PA	FA	M	FA	PA	M	M	PA		
		E3	FA	M	PA	M	PA	PA	FA	FA	M	M	FA	PA	M	M	PA		
		E4	FA	M	PA	M	PA	PA	FA	PA	FA	PA	PA	PA	M	M	PA		
FSE'20	AP37	E1	M	M	M	M	FA	M	FA	M	M	M	PA	FA	M	M	M	Yes	No
		E2	FA	M	M	M	FA	PA	FA	PA	PA	PA	PA	FA	PA	M	M		
		E3	FA	M	M	M	FA	M	FA	PA	PA	M	PA	FA	M	M	M		
		E4	FA	M	M	M	FA	M	FA	FA	PA	M	PA	FA	M	M	M		
FSE'20	AP38	E1	M	M	M	M	PA	PA	PA	M	M	M	M	M	M	M	M	Yes	No
		E2	FA	M	M	M	PA	PA	PA	PA	FA	PA	PA	PA	PA	M	M		
		E3	FA	M	M	M	PA	PA	PA	PA	FA	PA	PA	PA	PA	M	M		
		E4	FA	M	M	M	PA	PA	PA	PA	FA	PA	PA	PA	PA	M	M		
		E5	FA	M	M	M	PA	PA	PA	PA	FA	PA	PA	PA	PA	M	M		
		E6	M	M	M	M	M	M	PA	PA	FA	M	PA	PA	M	M	M		
FSE'21	AP42	E1	FA	M	PA	M	FA	FA	FA	PA	FA	PA	PA	FA	M	M	PA	Yes	No
		E2	FA	M	PA	M	FA	FA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E3	FA	M	PA	M	FA	FA	FA	PA	FA	PA	PA	FA	M	M	PA		
FSE'21	AP43	E1	FA	M	PA	M	PA	PA	PA	PA	FA	PA	PA	FA	M	M	PA	Yes	No
		E2	FA	M	PA	M	PA	PA	PA	PA	FA	M	PA	FA	M	M	PA		
		E3	FA	M	PA	M	PA	PA	PA	PA	FA	M	PA	FA	M	M	PA		
		E4	FA	M	PA	M	PA	PA	PA	PA	FA	M	PA	FA	M	M	PA		
FSE'21	AP40	E1	FA	M	PA	M	FA	PA	PA	PA	FA	PA	PA	M	M	M	PA	Yes	Yes
		E2	FA	M	PA	M	FA	PA	PA	PA	FA	PA	PA	M	M	M	PA		
		E3	FA	M	PA	M	FA	PA	PA	PA	FA	PA	PA	M	M	M	PA		
		E4	FA	M	PA	M	FA	PA	PA	PA	FA	PA	PA	M	M	M	PA		
		E5	M	M	PA	M	FA	PA	PA	FA	FA	PA	PA	M	FA	M	PA		

Characterization of ESEC/FSE papers

Venue	Paper #	Experiment	Hypotheses		Variables identification					Operationalization		Design		Population	Analysis		Validity evaluation	Artifact	
			Research	Statistical	Model hyperparameters	Model parameters	DL algorithm	Training hyperparameters	Training data	Factors and treatments	Response variables	Choice of design	Instrumentation	Test dataset	Descriptive statistics	Inferential statistics		Availability	Badge
FSE'21	AP41	E1	M	M	PA	M	PA	PA	M	FA	M	M	M	M	M	M	PA	Yes	Yes
		E2	FA	M	PA	M	PA	PA	FA	PA	FA	PA	PA	M	M	M	PA		
		E3	FA	M	PA	M	PA	PA	FA	PA	FA	M	PA	M	M	M	PA		
		E4	FA	M	PA	M	PA	PA	FA	PA	FA	PA	PA	M	M	M	PA		
		E5	FA	M	PA	M	PA	PA	FA	PA	FA	M	PA	M	M	M	PA		
		E6	M	M	PA	M	PA	PA	FA	PA	FA	M	PA	M	M	M	PA		
		E7	M	M	PA	M	PA	PA	FA	FA	FA	PA	PA	M	M	M	PA		
FSE'21	AP44	E1	FA	M	FA	M	FA	FA	FA	PA	PA	PA	PA	FA	PA	M	PA	Yes	No
FSE'21	AP45	E1	FA	M	PA	M	PA	FA	FA	PA	FA	PA	PA	FA	PA	FA	PA	Yes	No
		E2	FA	M	PA	M	PA	FA	FA	FA	FA	PA	PA	FA	PA	M	PA		
		E3	FA	M	PA	M	PA	FA	FA	PA	FA	PA	PA	FA	PA	FA	PA		
		E4	FA	M	PA	M	PA	FA	FA	PA	FA	PA	PA	FA	PA	M	PA		
FSE'21	AP39	E1	FA	M	FA	M	FA	FA	FA	PA	FA	PA	PA	FA	M	M	PA	Yes	Yes
		E2	FA	M	FA	M	FA	FA	FA	PA	FA	PA	PA	FA	PA	M	PA		
		E3	FA	M	FA	M	FA	FA	FA	PA	FA	PA	PA	FA	PA	M	PA		
		E4	FA	M	FA	M	FA	FA	FA	PA	FA	PA	PA	FA	PA	M	PA		
		E5	FA	M	FA	M	FA	FA	FA	PA	FA	PA	PA	FA	PA	M	PA		
		E6	FA	M	FA	M	FA	FA	FA	FA	FA	M	PA	FA	M	M	PA		
		E7	FA	M	FA	M	FA	FA	FA	PA	FA	M	PA	FA	M	M	PA		
		E8	FA	M	FA	M	FA	FA	FA	PA	FA	M	PA	FA	PA	M	PA		

EXPERIMENTS: 73

	Research	Statistical	Model hyperparameters	Model parameters	DL algorithm	Training hyperparameters	Training data	Factors and treatments	Response variables	Choice of design	Instrumentation	Test dataset	Descriptive statistics	Inferential statistics	Validity evaluation
COUNT M:	19	73	10	73	4	10	5	5	6	29	2	19	46	67	22
COUNT PA:	0	0	54	0	39	47	29	59	16	44	68	21	25	0	51
COUNT FA	54	0	9	0	30	16	39	9	51	0	3	33	2	6	0
% M	26%	100%	14%	100%	5%	14%	7%	7%	8%	40%	3%	26%	63%	92%	30%
% PA	0%	0%	74%	0%	53%	64%	40%	81%	22%	60%	93%	29%	34%	0%	70%
% FA	74%	0%	12%	0%	41%	22%	53%	12%	70%	0%	4%	45%	3%	8%	0%
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Characterization of TSE papers

Venue	Paper #	Experiment	Hypotheses	Variables identification					Operationalization		Design		Population	Analysis		Validity evaluation	Artifact	
			Research	Model hyperparameters	Model parameters	DL algorithm	Training hyperparameters	Training data	Factors and treatments	Response variables	Choice of design	Instrumentation	Test dataset	Descriptive statistics	Inferential statistics		Availability	Badge
TSE'19	AP46	E1	M	PA	M	FA	FA	FA	FA	FA	M	PA	FA	M	M	PA	Yes	No
		E2	FA	PA	M	FA	FA	FA	PA	FA	PA	PA	FA	FA	FA	PA		
		E3	FA	PA	M	FA	FA	FA	PA	FA	PA	PA	FA	FA	FA	PA		
		E4	FA	PA	M	FA	FA	FA	PA	FA	PA	PA	FA	FA	FA	PA		
		E5	FA	PA	M	FA	FA	FA	PA	FA	PA	PA	FA	FA	FA	PA		
		E6	FA	PA	M	FA	FA	FA	PA	FA	PA	PA	FA	FA	FA	PA		
TSE'20	AP47	E1	M	PA	M	PA	PA	FA	FA	FA	M	PA	FA	M	M	PA	Yes	No
		E2	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	PA	M	PA		
		E3	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	PA	M	PA		
		E4	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	PA	M	PA		
TSE'20	AP48	E1	M	PA	M	PA	PA	FA	FA	FA	M	PA	FA	M	M	PA	Yes	No
		E2	M	PA	M	PA	PA	FA	FA	FA	M	PA	FA	M	M	PA		
		E3	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	FA	FA	PA		
		E4	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	FA	FA	PA		
		E5	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	FA	FA	PA		
		E6	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	FA	FA	PA		
TSE'20	AP49	E1	M	FA	M	FA	PA	FA	FA	FA	M	PA	FA	M	M	PA	Yes	No
		E2	FA	FA	M	FA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E3	FA	FA	M	FA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E4	FA	FA	M	FA	PA	FA	PA	FA	PA	PA	FA	FA	FA	PA		
TSE'21	AP50	E1	FA	PA	M	PA	FA	FA	PA	FA	PA	PA	FA	PA	M	PA	Yes	No
		E2	FA	PA	M	PA	FA	FA	PA	PA	PA	PA	FA	PA	M	PA		
		E3	FA	PA	M	PA	FA	FA	PA	PA	PA	PA	FA	PA	M	PA		
		E4	FA	PA	M	PA	FA	FA	PA	FA	M	PA	FA	M	M	PA		
		E5	M	PA	M	PA	FA	FA	FA	FA	M	PA	FA	PA	M	PA		
TSE'21	AP51	E1	M	PA	M	PA	PA	FA	FA	M	PA	PA	FA	M	M	PA	Yes	No
		E2	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
		E3	FA	PA	M	PA	PA	FA	PA	FA	PA	PA	FA	M	M	PA		
TSE'21	AP52	E1	FA	PA	M	PA	PA	FA	PA	PA	PA	PA	FA	PA	M	PA	Yes	No
		E2	FA	PA	M	PA	PA	FA	PA	PA	PA	PA	FA	PA	M	PA		
		E3	FA	PA	M	PA	PA	FA	PA	PA	PA	PA	FA	PA	M	PA		
		E4	FA	PA	M	PA	PA	FA	PA	PA	PA	PA	FA	PA	FA	PA		
		E5	FA	PA	M	PA	PA	FA	PA	PA	PA	PA	FA	PA	M	PA		
		E6	FA	PA	M	PA	PA	FA	PA	PA	PA	PA	FA	PA	M	PA		
TSE'21	AP55	E1	FA	PA	M	FA	PA	FA	PA	FA	PA	PA	FA	PA	M	FA	Yes	No
		E2	FA	PA	M	FA	PA	FA	PA	FA	PA	PA	FA	PA	M	FA		
		E3	FA	PA	M	FA	PA	FA	PA	FA	PA	PA	FA	PA	M	FA		
TSE'21	AP54	E1	FA	PA	M	PA	PA	FA	PA	PA	PA	PA	FA	M	M	PA	Yes	No
		E2	FA	PA	M	PA	PA	FA	PA	PA	M	PA	FA	M	M	PA		
TSE'21	AP53	E1	FA	PA	M	PA	PA	PA	PA	FA	PA	PA	FA	PA	FA	PA	No	No
		E2	FA	PA	M	PA	PA	PA	PA	FA	PA	PA	FA	PA	FA	PA		
		E3	FA	PA	M	PA	PA	PA	FA	FA	PA	PA	FA	PA	M	PA		
		E4	FA	PA	M	PA	PA	PA	FA	FA	PA	PA	FA	PA	M	PA		

Characterization of TSE papers

Venue	Paper #	Experiment	Hypotheses Research	Variables identification Model hyperparameters	Model parameters	DL algorithm	Training hyperparameters	Training data	Operationalization Factors and treatments	Response variables	Design Choice of design	Instrumentation	Population Test dataset	Analysis Descriptive statistics	Inferential statistics	Validity evaluation	Artifact Availability	Badge
EXPERIMENTS:		43																
COUNT M:			7	0	43	0	0	0	0	1	8	0	0	13	30	0		
COUNT PA:			0	39	0	30	32	4	33	10	35	43	0	20	0	40		
COUNT FA			36	4	0	13	11	39	10	32	0	0	43	10	13	3		
% M			16%	0%	100%	0%	0%	0%	0%	2%	19%	0%	0%	30%	70%	0%		
% PA			0%	91%	0%	70%	74%	9%	77%	23%	81%	100%	0%	47%	0%	93%		
% FA			84%	9%	0%	30%	26%	91%	23%	74%	0%	0%	100%	23%	30%	7%		
TOTAL			100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		