Complex Pier Scour Calculator with Neural Network Method

Spreadsheet Mode | Individual Mode | About

	Database No.	Data Source	Lab	Run	Type	o ys
1	1	Beheshti, Ataie-Ashtiani 2016	Sharif University	scoured_bed	complex pier	0.
2	2	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-1	complex pier	0.
3	3	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-2	complex pier	0.
4	4	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-3	complex pier	0.
5	5	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-4	complex pier	0.
6	6	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-5	complex pier	0.
7	7	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-6	complex pier	0.
8	8	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-7	complex pier	0.
9	9	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-8	complex pier	0.
10	10	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-9	complex pier	0.
11	11	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-10	complex pier	0.
12	12	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-11	complex pier	0.
13	13	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-12	complex pier	0.
14	14	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-13	complex pier	0.
15	15	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-14	complex pier	0.
16	16	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-15	complex pier	0.
17	17	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-16	complex pier	0.
18	18	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-17	complex pier	0.
19	19	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-18	complex pier	0.
20	20	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-19	complex pier	0.
21	21	Ataie-Ashtiani, Baratian, Beheshti 2010	Sharif University of Technology	Model I-20	complex pier	0.

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	observed ys (m)	t (h)	Flume data	Flume width B (m)	Flume length (m)	Sediment data	d_50 (mm)	σ_g	Flow data	y (m)	V (m/s)	V_c (m/s)	Method of calculating V_c
1	r 0.155	72	****	1.26	15	****	0.71	1.2	****	0.301	0.358	0.37	Beheshti&Ataie 2008
2	r 0.041998	10.5	****	0.6	16	****	0.6	1.2	****	0.140998	0.232863823	0.31	Beheshti&Ataie 2009
3	r 0.037004	35.5	****	0.6	17	****	0.6	1.2	****	0.134992	0.24322429	0.30	Beheshti&Ataie 2010
4	r 0.041998	15.8	****	0.6	18	****	0.6	1.2	****	0.134002	0.246264981	0.30	Beheshti&Ataie 2011
5	r 0.037994	15.8	****	0.6	19	****	0.6	1.2	****	0.145992	0.243164009	0.31	Beheshti&Ataie 2012
6	r 0.026004	36	****	0.6	20	****	0.6	1.2	****	0.140998	0.258372459	0.31	Beheshti&Ataie 2013
7	r 0.033	34.5	****	0.6	21	****	0.6	1.2	****	0.156002	0.232689324	0.31	Beheshti&Ataie 2014
8	r 0.017996	54	****	0.6	22	****	0.6	1.2	****	0.147004	0.243077286	0.31	Beheshti&Ataie 2015
9	r 0.055	72	****	0.6	23	****	0.6	1.2	****	0.151998	0.264257863	0.31	Beheshti&Ataie 2016
10	r 0.008008	36	****	0.6	24	****	0.6	1.2	****	0.151998	0.23465221	0.31	Beheshti&Ataie 2017
11	r 0.022	75	****	0.6	25	****	0.6	1.2	****	0.149006	0.251667718	0.31	Beheshti&Ataie 2018
12	r 0.030008	72	****	0.6	26	****	0.6	1.2	****	0.154	0.229437229	0.31	Beheshti&Ataie 2019
13	r 0.052008	46	****	0.6	27	****	0.6	1.2	****	0.147004	0.234687491	0.31	Beheshti&Ataie 2020
14	r 0.04499	18.8	****	0.6	28	****	0.6	1.2	****	0.147004	0.233553735	0.31	Beheshti&Ataie 2021
15	r 0.03399	18.6	****	0.6	29	****	0.6	1.2	****	0.145992	0.232889473	0.31	Beheshti&Ataie 2022
16	r 0.046002	36	****	0.6	30	****	0.6	1.2	****	0.149006	0.244956579	0.31	Beheshti&Ataie 2023
17	r 0.04499	14.3	****	0.6	31	****	0.6	1.2	****	0.149006	0.227060208	0.31	Beheshti&Ataie 2024
18	r 0.046002	20.6	****	0.6	32	****	0.6	1.2	****	0.147994	0.228612872	0.31	Beheshti&Ataie 2025
19	r 0.04301	16.5	****	0.6	33	****	0.6	1.2	****	0.149996	0.226672711	0.31	Beheshti&Ataie 2026
20	r 0.059994	28.5	****	0.6	34	****	0.6	1.2	****	0.151998	0.223687154	0.31	Beheshti&Ataie 2027
21	r 0.059994	32.5	****	0.6	35	****	0.6	1.2	****	0.149996	0.236672978	0.31	Beheshti&Ataie 2028

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	Pier data	Column dimensions	b_col (m)	Column length L_col (m)	Column Shape	Ks,col (HEC-18)	Pile cap dimensions	b_pc (m)	L_pc (m)	T (m)	f_1 (m)	f_2 (m)	h_0 (m) (positive above bed)
1	****	****	0.068	0.303	Square Nose	1.1	****	0.14	0.42	0.0336	0.059	0.036	0.0279
2	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.102004
3	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.091994
4	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.082006
5	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.071996
6	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.032
7	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.032
8	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.045002
9	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.014994
10	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.036004
11	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.029998
12	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.025004
13	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.025004
14	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.023992
15	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.023992
16	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.018998
17	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.018008
18	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.018008
19	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.014004
20	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.014994
21	****	****	0.022	0.15	Round Nose	1	****	0.09	0.18	0.032	0.015	0.034	-0.00901

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Complex Pier Scour Calculator with Neural Network Method

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	h_1 (m)	Pile cap shape	Ks,pc (HEC-18)	Pile group dimensions	b_p (m)	m	n	S_n (m)	S_m (m)	Pile shape	Ks_pg (HEC-18)	← End of data / Results →	ys (m) Neural Network [NN-1111]	y
1	0.0615	Square Nose	1.1	****	0.0254	4	2	0.0762	0.0762	Group of Cylinders	1	****	0.122	0
2	-0.070004	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.048	0
3	-0.059994	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.050	0
4	-0.050006	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.037	0
5	-0.039996	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.033	0
6	0	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.055	0
7	0	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.051	0
8	-0.013002	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.044	0
9	0.017006	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.054	0
10	-0.004004	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.043	0
11	0.002002	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.054	0
12	0.006996	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.050	0
13	0.006996	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.051	0
14	0.008008	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.051	0
15	0.008008	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.051	0
16	0.013002	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.053	0
17	0.013992	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.050	0
18	0.013992	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.050	0
19	0.017996	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.050	0
20	0.017006	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.049	0
21	0.02299	Square Nose	1.1	****	0.016	3	2	0.032	0.04	Group of Cylinders	1	****	0.051	0

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	← End of data / Results →	ys (m) Neural Network [NN-1111]	ys (m) Neural Network [NN-3343]	ys (m) Support vector machine [SVM]	ys (m) Genetic Programming [GP2]	ys (m) Adaptive Neuro Fuzzy Inference System [ANFIS]	ys (m) Amini Baghbadorani et al. (2018) updated
1	****	0.122	0.135	0.147	0.149	0.118	0.114
2	****	0.048	0.048	0.048	0.048	0.048	0.048
3	****	0.050	0.050	0.050	0.050	0.050	0.050
4	****	0.037	0.044	0.039	0.039	0.038	0.025
5	****	0.033	0.042	0.023	0.035	0.033	0.022
6	****	0.055	0.025	0.028	0.035	0.049	0.054
7	****	0.051	0.031	0.037	0.041	0.048	0.051
8	****	0.044	0.031	0.020	0.037	0.035	0.027
9	****	0.054	0.053	0.050	0.053	0.056	0.056
10	****	0.043	0.019	0.031	0.035	0.033	0.021
11	****	0.054	0.032	0.036	0.043	0.050	0.054
12	****	0.050	0.039	0.040	0.047	0.049	0.051
13	****	0.051	0.037	0.037	0.046	0.049	0.052
14	****	0.051	0.039	0.038	0.047	0.049	0.052
15	****	0.051	0.038	0.037	0.047	0.049	0.052
16	****	0.053	0.047	0.044	0.054	0.052	0.053
17	****	0.050	0.045	0.042	0.052	0.050	0.051
18	****	0.050	0.045	0.042	0.052	0.050	0.051
19	****	0.050	0.049	0.045	0.051	0.051	0.051
20	****	0.049	0.048	0.045	0.048	0.050	0.050
21	****	0.051	0.053	0.049	0.056	0.054	0.053

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Metadata

Model Name:	Model II(2)
Run Number:	1
Time (h):	72

Flow

V (m/s):	0.358
Vc (m/s):	0.37
y (m):	0.301

Sediment

d50 (mm):	0.71
σg :	1.2

Column

bcol (m):	0.068
Lcol (m):	0.303
Ks,col:	1.1

Column Shape: Rectangular (Square Nose)

Pile cap

bpc (m)	0.14
Lpc (m)	0.42
h0 (m)	0.0279
h1 (m)	0.0615
T (m):	0.0336
f1 (m)	0.059
f2 (m)	0.036
Ks,pc:	1.1

Pile Cap Shape: Rectangular (Square Nose)

Pile Group

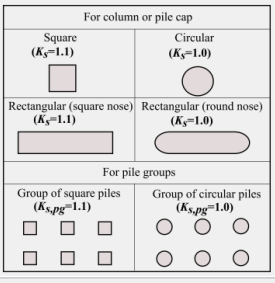
bp (m):	0.0254
Sn (m):	0.0762
Sm (m):	0.0762
n:	2
m:	4
Ks,pg:	1.0

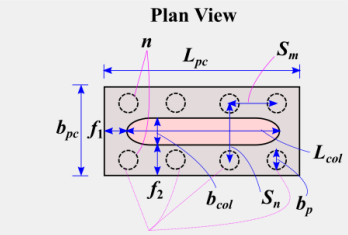
Pile Group Shape: Group of cylinders

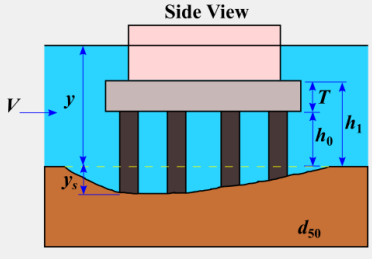
Scour depth, ys (m):

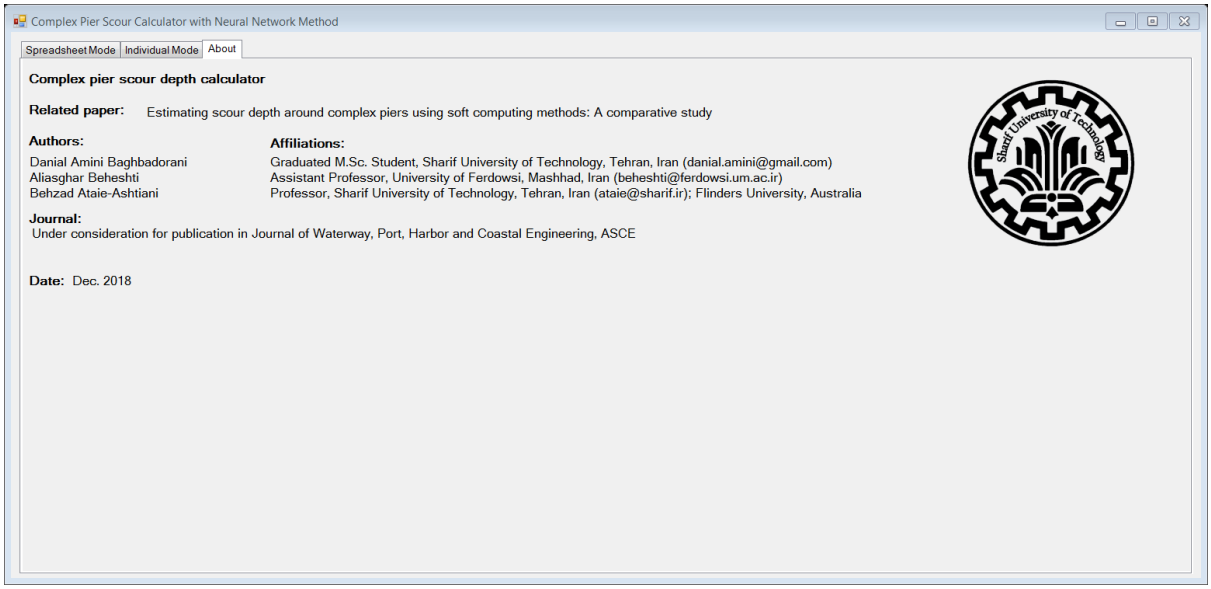
NN-1111:	0.122
NN-3343:	0.135
SVM:	0.147
GP2:	0.149
ANFIS:	0.118
Amini Baghbadorani et al. (2018) (updated)	0.114

Clear | Calcule





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About
Complex pier scour depth calculator
Related paper: Estimating scour depth around complex piers using soft computing methods: A comparative study
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Journal:
Under consideration for publication in Journal of Waterway, Port, Harbor and Coastal Engineering, ASCE
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Sharif University of Technology