

SUPPLEMENTAL MATERIALS

Ground-truth of benchmark images/video



Fig. S1: Ground-truth of eight small benchmark images.

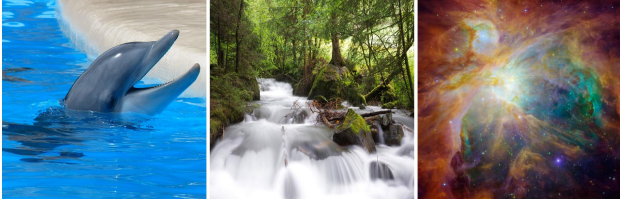


Fig. S2: Ground-truth of three high-resolution benchmark images.

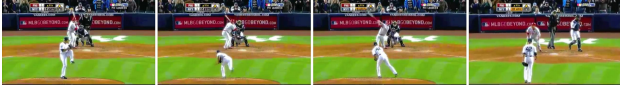


Fig. S3: Ground-truth of the benchmark video.

RSE curves of Large images inpainting

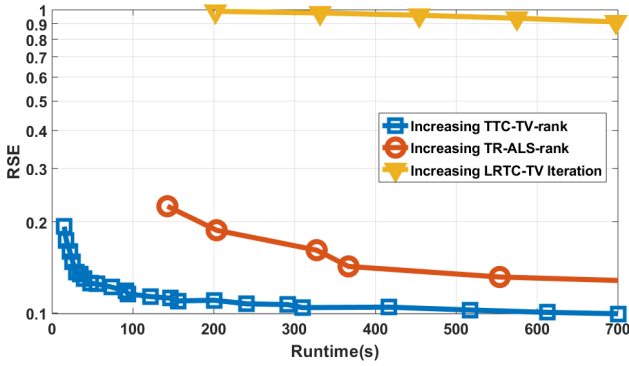


Fig. S4: Obtained RSE of TTC-TV, TR-ALS and LRTC-TV on the *Dolphin* benchmark image versus the total runtime for increasing TT-ranks or number of iterations.

Choice of tuning parameters

All tuning parameters of the different methods used in Section 4 are listed below so that all reported results can be reproduced.

TABLE S1: House

Method	Tunning Parameters
TNN	$\alpha = 1, \rho = 0.01, \text{MaxItr} = 140$
HaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 80, \epsilon = 1e-7, \rho = 1e-6$
FaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 200, \epsilon = 1e-7, \mu = \frac{5\alpha}{\sqrt{\text{size}(\mathcal{A})}}, C = 0.6, L0 = 1e-6$
LRTC-TV	$\lambda_1 = 0.5, \lambda_2 = 1000, \alpha = [\frac{1}{N}, \frac{1}{N}, \frac{1}{N}], \beta = [1, 1, 0]$
TMac	$\alpha_{\text{adj}} = 0, \text{rank}_{\text{adj}} = [2, 2, 2], \text{rank}_{\text{max}} = [8, 8, 8], \text{MaxItr} = 540$
TMac-TT	$\text{thl} = 0.03, \text{tol} = 1e-10, \text{MaxItr} = 1000$
TR-ALS	$\text{Max}_{\text{tot}} = 1e-3, \text{MaxItr} = 300, R = [7, 7, 7, 7, 7, 7, 7]$
TTC	$h = 22, \text{Itr} = 2, R = [1, 6, 11, 11, 11, 17, 3]$
TTC-TV	$h = 22, \lambda = 0.2, \text{Itr} = 2, R = [1, 6, 11, 11, 11, 17, 3]$

TABLE S2: River

Method	Tunning Parameters
TNN	$\alpha = 1, \rho = 0.01, \text{MaxItr} = 140$
HaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 80, \epsilon = 1e-7, \rho = 1e-6$
FaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 40, \epsilon = 1e-7, \mu = \frac{5\alpha}{\sqrt{\text{size}(\mathcal{A})}}, C = 0.6, L0 = 1e-6$
LRTC-TV	$\lambda_1 = 0.5, \lambda_2 = 1000, \alpha = [\frac{1}{N}, \frac{1}{N}, \frac{1}{N}], \beta = [1, 1, 0]$
TMac	$\alpha_{\text{adj}} = 0, \text{rank}_{\text{adj}} = [2, 2, 2], \text{rank}_{\text{max}} = [8, 8, 8], \text{MaxItr} = 380$
TMac-TT	$\text{thl} = 0.03, \text{tol} = 1e-10, \text{MaxItr} = 1000$
TR-ALS	$\text{Max}_{\text{tot}} = 1e-3, \text{MaxItr} = 300, R = [8, 8, 8, 8, 8, 8, 8]$
TTC	$h = 22, \text{Itr} = 2, R = [1, 3, 14, 14, 14, 17, 3]$
TTC-TV	$h = 22, \lambda = 0.2, \text{Itr} = 2, R = [1, 3, 14, 14, 14, 17, 3]$

TABLE S3: Bridge

Method	Tunning Parameters
TNN	$\alpha = 1, \rho = 0.01, \text{MaxItr} = 200$
HaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 180, \epsilon = 1e-7, \rho = 1e-6$
FaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 180, \epsilon = 1e-7, \mu = \frac{5\alpha}{\sqrt{\text{size}(\mathcal{A})}}, C = 0.6, L0 = 1e-6$
LRTC-TV	$\lambda_1 = 0.5, \lambda_2 = 1000, \alpha = [\frac{1}{N}, \frac{1}{N}, \frac{1}{N}], \beta = [1, 1, 0]$
TMac	$\alpha_{\text{adj}} = 0, \text{rank}_{\text{adj}} = [2, 2, 2], \text{rank}_{\text{max}} = [8, 8, 8], \text{MaxItr} = 480$
TMac-TT	$\text{thl} = 0.04, \text{tol} = 1e-5, \text{MaxItr} = 1000$
TR-ALS	$\text{Max}_{\text{tot}} = 1e-3, \text{MaxItr} = 300, R = [7, 7, 7, 7, 7, 7, 7]$
TTC	$h = 22, \text{Itr} = 2, R = [1, 5, 11, 11, 11, 17, 3]$
TTC-TV	$h = 22, \lambda = 0.2, \text{Itr} = 2, R = [1, 5, 11, 11, 11, 17, 3]$

TABLE S4: Man

Method	Tunning Parameters
TNN	$\alpha = 1, \rho = 0.01, \text{MaxItr} = 150$
HaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 240, \epsilon = 1e-7, \rho = 1e-6$
FaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 40, \epsilon = 1e-7, \mu = \frac{5\alpha}{\sqrt{\text{size}(\mathcal{A})}}, C = 0.6, L0 = 1e-6$
LRTC-TV	$\lambda_1 = 0.5, \lambda_2 = 1000, \alpha = [\frac{1}{N}, \frac{1}{N}, \frac{1}{N}], \beta = [1, 1, 0]$
TMac	$\alpha_{\text{adj}} = 0, \text{rank}_{\text{adj}} = [2, 2, 2], \text{rank}_{\text{max}} = [8, 8, 8], \text{MaxItr} = 540$
TMac-TT	$\text{thl} = 0.04, \text{tol} = 1e-6, \text{MaxItr} = 1000$
TR-ALS	$\text{Max}_{\text{tot}} = 1e-3, \text{MaxItr} = 300, R = [8, 8, 8, 8, 8, 8, 8]$
TTC	$h = 22, \text{Itr} = 2, R = [1, 2, 16, 16, 16, 19, 3]$
TTC-TV	$h = 22, \lambda = 0.2, \text{Itr} = 2, R = [1, 2, 16, 16, 16, 19, 3]$

TABLE S5: Lena

Method	Tunning Parameters
TNN	$\alpha = 1, \rho = 0.01, \text{MaxItr} = 110$
HaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 140, \epsilon = 1e-7, \rho = 1e-6$
FaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 40, \epsilon = 1e-7, \mu = \frac{5\alpha}{\sqrt{\text{size}(\mathcal{A})}}, C = 0.6, L0 = 1e-6$
LRTC-TV	$\lambda_1 = 0.5, \lambda_2 = 1000, \alpha = [\frac{1}{N}, \frac{1}{N}, \frac{1}{N}], \beta = [1, 1, 0]$
TMac	$\alpha_{\text{adj}} = 0, \text{rank}_{\text{adj}} = [2, 2, 2], \text{rank}_{\text{max}} = [8, 8, 8], \text{MaxItr} = 440$
TMac-TT	$\text{thl} = 0.05, \text{tol} = 1e-7, \text{MaxItr} = 1000$
TR-ALS	$\text{Max}_{\text{tot}} = 1e-3, \text{MaxItr} = 300, R = [7, 7, 7, 7, 7, 7, 7]$
TTC	$h = 22, \text{Itr} = 3, R = [1, 2, 12, 14, 14, 26, 3]$
TTC-TV	$h = 22, \text{Itr} = 2, R = [1, 2, 12, 14, 14, 26, 3]$
TTC-TV	$h = 22, \lambda = 0.2, \text{Itr} = 2, R = [1, 2, 12, 14, 14, 26, 3]$

TABLE S6: Peppers

Method	Tunning Parameters
TNN	$\alpha = 1, \rho = 0.01, \text{MaxItr} = 120$
HaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 100, \epsilon = 1e-8, \rho = 1e-6$
FaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 40, \epsilon = 1e-7, \mu = \frac{5\alpha}{\sqrt{\text{size}(\mathcal{A})}}, C = 0.6, L0 = 1e-6$
LRTC-TV	$\lambda_1 = 0.5, \lambda_2 = 1000, \alpha = [\frac{1}{N}, \frac{1}{N}, \frac{1}{N}], \beta = [1, 1, 0]$
TMac	$\alpha_{\text{adj}} = 0, \text{rank}_{\text{adj}} = [2, 2, 2], \text{rank}_{\text{max}} = [12, 12, 12], \text{MaxItr} = 540$
TMac-TT	$\text{thl} = 0.06, \text{tol} = 1e-7, \text{MaxItr} = 1000$
TR-ALS	$\text{Max}_{\text{tot}} = 1e-3, \text{MaxItr} = 300, R = [9, 9, 9, 9, 9, 9, 9]$
TTC	$h = 22, \text{Itr} = 2, R = [1, 2, 12, 16, 16, 25, 3]$
TTC-TV	$h = 22, \lambda = 0.2, \text{Itr} = 2, R = [1, 2, 12, 16, 16, 25, 3]$

TABLE S7: Baboon

Method	Tunning Parameters
TNN	$\alpha = 1, \rho = 0.01, \text{MaxItr} = 120$
HaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 80, \epsilon = 1e-8, \rho = 1e-6$
FaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 80, \epsilon = 1e-7, \mu = \frac{5\alpha}{\sqrt{\text{size}(\mathcal{A})}}, C = 0.6, L0 = 1e-6$
LRTC-TV	$\lambda_1 = 0.5, \lambda_2 = 1000, \alpha = [\frac{1}{N}, \frac{1}{N}, \frac{1}{N}], \beta = [1, 1, 0]$
TMac	$\alpha_{\text{adj}} = 0, \text{rank}_{\text{adj}} = [2, 2, 2], \text{rank}_{\text{max}} = [8, 8, 8], \text{MaxItr} = 460$
TMac-TT	$\text{thl} = 0.05, \text{tol} = 1e-8, \text{MaxItr} = 1000$
TR-ALS	$\text{Max}_{\text{tot}} = 1e-3, \text{MaxItr} = 300, R = [6, 6, 6, 6, 6, 6, 6]$
TTC	$h = 22, \text{Itr} = 2, R = [1, 2, 8, 8, 8, 20, 3]$
TTC-TV	$h = 22, \lambda = 0.2, \text{Itr} = 2, R = [1, 2, 8, 8, 8, 20, 3]$

TABLE S8: Airplane

Method	Tunning Parameters
TNN	$\alpha = 1, \rho = 0.01, \text{MaxItr} = 140$
HaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 160, \epsilon = 1e-7, \rho = 1e-6$
FaLRTC	$\alpha = [1, 1, 1e-3], \text{MaxItr} = 160, \epsilon = 1e-7, \mu = \frac{5\alpha}{\sqrt{\text{size}(\mathcal{A})}}, C' = 0.6, L0 = 1e-6$
LRTC-TV	$\lambda_1 = 0.5, \lambda_2 = 1000, \alpha = [\frac{1}{N}, \frac{1}{N}, \frac{1}{N}], \beta = [1, 1, 0]$
TMac	$\alpha_{\text{adj}} = 0, \text{rank}_{\text{adj}} = [2, 2, 2], \text{rank}_{\text{max}} = [8, 8, 8], \text{MaxItr} = 560$
TMac-TT	$\text{thl} = 0.06, \text{tol} = 1e-9, \text{MaxItr} = 1000$
TR-ALS	$\text{Max}_{\text{tot}} = 1e-3, \text{MaxItr} = 300, R = [5, 5, 5, 5, 5, 5]$
TTC	$h = 22, \text{Itr} = 2, R = [1, 3, 12, 12, 12, 16, 3]$
TTC-TV	$h = 22, \lambda = 0.2, \text{Itr} = 2, R = [1, 3, 12, 12, 12, 16, 3]$

TABLE S9: Dolphin

Method	Tunning Parameters
LRTC-TV	$\lambda_1 = 0.5, \lambda_2 = 1000, \alpha = [\frac{1}{N}, \frac{1}{N}, \frac{1}{N}], \beta = [1, 1, 0]$
TR-ALS	$\text{Max}_{\text{tot}} = 1e-3, \text{MaxItr} = 300$
TTC-TV	$h = 22, \lambda = 0.2, \text{Itr} = 2$

TABLE S10: Water Nature Fall

Method	Tunning Parameters
LRTC-TV	$\lambda_1 = 0.5, \lambda_2 = 1000, \alpha = [\frac{1}{N}, \frac{1}{N}, \frac{1}{N}], \beta = [1, 1, 0]$
TR-ALS	$\text{Max}_{\text{tot}} = 1e-3, \text{MaxItr} = 300$
TTC-TV	$h = 22, \lambda = 0.2, \text{Itr} = 2$

TABLE S11: Orion nebula

Method	Tunning Parameters
LRTC-TV	$\lambda_1 = 0.5, \lambda_2 = 1000, \alpha = [\frac{1}{N}, \frac{1}{N}, \frac{1}{N}], \beta = [1, 1, 0]$
TR-ALS	$\text{Max}_{\text{tot}} = 1e-3, \text{MaxItr} = 300$
TTC-TV	$h = 22, \lambda = 0.2, \text{Itr} = 2$

TABLE S12: Baseball Pitcher Mariano Rivera

Method	Tunning Parameters
LRTC-TV	$\lambda_1 = 0.5, \lambda_2 = 1000, \alpha = [\frac{1}{N}, \frac{1}{N}, \frac{1}{N}], \beta = [1, 1, 0]$
TR-ALS	$\text{Max}_{\text{tot}} = 1e-3, \text{MaxItr} = 300, R = [4, 4, 4, 4, 4, 4, 4, 4, 4, 4]$
TTC	$h = 22, \text{Itr} = 2, R = [1, 5, 5, 5, 5, 5, 5, 5, 5, 3]$