

# Fast Lossy Compression of 3D Unit Vector Sets

## Supplemental Material

Sylvain Rousseau    Tamy Boubekeur  
 LTCI, Telecom ParisTech, Paris-Saclay University

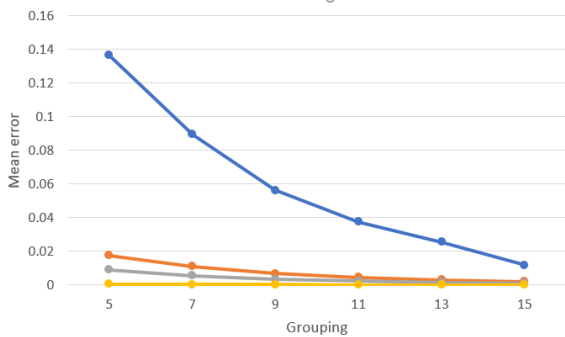
Following results have been computed using 10 million random unit vectors. "SF" is the abbreviation for spherical Fibonacci point set quantization. Others abbreviations come from the survey [Cigolle & al. 2014].

### Result on additional quantification methods, grouping with 13 bits.

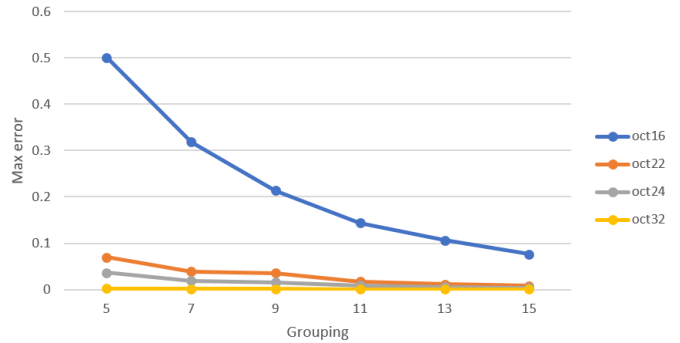
Method	Bits	Mean error (°)	Max error (°)	Mean error with mapping (°)	Max error with mapping (°)	Compression (sec) with mapping	Decompression (sec) with mapping	Compression Ratio with mapping
Oct	16	0.3370	0.9510	0.0256	0.1066	0.42	0.26	5.99019
	22	0.0418	0.1180	0.0031	0.0112	0.42	0.26	4.35893
	24	0.0209	0.0592	0.0015	0.0054	0.42	0.26	3.99564
	32	0.0013	0.0037	0.0001	0.0003	0.42	0.27	2.99754
SF	16	0.3030	0.5895	0.0229	0.0696	1.39	0.48	5.99019
	22	0.0378	0.0700	0.0028	0.0074	1.39	0.48	4.35893
Spherical	16	0.3564	0.7910	0.0273	0.1110	0.57	0.36	5.99019
	22	0.0442	0.0983	0.0033	0.0109	0.57	0.36	4.35893
	24	0.0221	0.0490	0.0016	0.0056	0.57	0.36	3.99564
	32	0.0014	0.0137	0.0001	0.0011	0.57	0.37	2.99754
Eq Area	16	0.3879	1.0031	0.0298	0.1181	0.43	0.31	5.99019
	22	0.0482	0.1244	0.0036	0.0118	0.43	0.31	4.35893
	24	0.0241	0.0619	0.0018	0.0059	0.43	0.31	3.99564
	32	0.0015	0.0039	0.0001	0.0004	0.43	0.31	2.99754
Eq Dist	16	0.3847	0.7918	0.0295	0.1024	0.49	0.36	5.99019
	22	0.0478	0.0983	0.0036	0.0104	0.49	0.36	4.35893
	24	0.0239	0.0491	0.0018	0.0052	0.49	0.36	3.99564
	32	0.0015	0.0031	0.0001	0.0007	0.49	0.37	2.99754
Stereo	16	0.4016	1.0048	0.0308	0.1237	0.41	0.32	5.99019
	22	0.0498	0.1250	0.0037	0.0119	0.41	0.32	4.35893
	24	0.0249	0.0624	0.0018	0.0060	0.41	0.32	3.99564
	32	0.0015	0.0051	0.0001	0.0014	0.42	0.32	2.99754

### Octahedral quantization with different groupings.

Mean error



Maximal error



		Grouping					
		5 bits	7 bits	9 bits	11 bits	13 bits	15 bits
Quantization	16 bits	0.1364	0.0894	0.0562	0.0374	0.0256	0.0118
	22 bits	0.0175	0.0109	0.0067	0.0045	0.0031	0.0020
	24 bits	0.0089	0.0055	0.0032	0.0023	0.0015	0.0010
	32 bits	0.0005	0.0003	0.0002	0.0001	0.0001	0.0001

		Grouping					
		5 bits	7 bits	9 bits	11 bits	13 bits	15 bits
Quantization	16 bits	0.5008	0.3187	0.2138	0.1437	0.1066	0.0762
	22 bits	0.0699	0.0387	0.0358	0.0168	0.0112	0.0075
	24 bits	0.0365	0.0191	0.0155	0.0085	0.0054	0.0036
	32 bits	0.0023	0.0014	0.0010	0.0005	0.0003	0.0002

## Compression ratio overhead

