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I Introduction

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[illegible] n [illegible] e e dd e [illegible] e [illegible] o e [illegible] of [illegible] o n [illegible] e [illegible] c [illegible] on of f nc on [illegible] n [illegible] e ee [illegible] e [illegible] con de co [illegible] n [illegible] ^{2} n [illegible] e ee [illegible] nce [illegible] e [illegible] od c of o f nc on [illegible] y e en [illegible] $\frac{1}{4}$ [illegible] ^{2} — [illegible] — [illegible] ^{2}

[illegible] e [illegible] e [illegible] fo d o [illegible] o d e [illegible] e co [illegible] n [illegible] e e [illegible] n on of [illegible] e [illegible] od c of [illegible] e [illegible] f nc on [illegible] o n nd n [illegible] e [illegible] o [illegible] e fo [illegible] e [illegible] c on ne c en [illegible] o [illegible] e [illegible] e co [illegible] n [illegible] e coe c en

$$c^{\mathbf{j;j';m}}_{\mathbf{k;k';l}} \quad \int_{-\infty}^{+\infty} \quad \mathbf{^{j}_{k}} \quad \mathbf{^{j'}_{k'}} \quad \mathbf{^{m}_{l}} \quad d \; M$$

[illegible] e e $\mathbf{^{j}_{k}}$ [illegible] $-\mathbf{j}{=}2$ [illegible] $-\mathbf{j}$ — e [illegible] e [illegible] f nc on [illegible] e co [illegible] n $c^{\mathbf{j;j';m}}_{\mathbf{k;k';l}}$ doe [illegible] no [illegible] e en [illegible] o e [illegible] e n [illegible] e of [illegible] e nonze o of coe c en [illegible] e nd [illegible] e [illegible] o n [illegible] e n [illegible] e of o [illegible] e on [illegible] o co [illegible] e ^{2} [illegible] o o on o $N_{\mathbf{s}}^3$ [illegible] e e $N_{\mathbf{s}}$ [illegible] e n [illegible] e of [illegible] n [illegible] c n coe c en [illegible] n [illegible] e e [illegible] e en on of

n n [illegible] e of [illegible] c on [illegible] e f nc on of n e e [illegible] e [illegible] e f nc on [illegible] e [illegible] n o o [illegible] o y fe oc on [illegible] e n [illegible] e of [illegible] n [illegible] c n e e coe c en [illegible] of [illegible] f nc on [illegible] on e [illegible] e [illegible] $N_{\mathbf{s}}$ [illegible] o o on o o [illegible]

II Multiresolution algorithm for evaluating u

nco n n c on n sc s

Le sconsde e o ec ons of $\in \mathbf{L}^2(\mathbf{R})$ on s ce s $\mathbf{V}_\mathbf{j}$

$$\mathbf{j} \quad \mathbf{j} \quad M \quad \mathbf{j} \in \mathbf{V}_\mathbf{j} M$$

e e $\{\mathbf{V}_\mathbf{j}\}_{\mathbf{j}\in\mathbf{Z}}$ s e o on n y s s of $\mathbf{L}^2(\mathbf{R})$ n o de o nco e e n e c on e een c e s e e e co c e es

$$_0^2 - \ _\mathbf{n}^2 \quad \sum_{\mathbf{j}=1}^{\mathbf{j}=\mathbf{n}} \left[\ _{\mathbf{j}-1}^{\ 2} - \ _\mathbf{j}^{\ 2} \right] \quad \sum_{\mathbf{j}=1}^{\mathbf{j}=\mathbf{n}} \ _{\mathbf{j}-1} \quad \mathbf{j} \quad _{\mathbf{j}-1} - \ \mathbf{j}$$

sn $\mathbf{j}-1$ $\mathbf{j}$ $\mathbf{j}$ e o n

$$_0^2 - \ _\mathbf{n}^2 \quad \sum_{\mathbf{j}=1}^{\mathbf{j}=\mathbf{n}} \ \mathbf{j} \quad \mathbf{j} \quad \mathbf{j} \quad M \qquad (3)$$

o

$$_0^2 \quad \sum_{\mathbf{j}=1}^{\mathbf{j}=\mathbf{n}} \ \mathbf{j} \quad \mathbf{j}$$

o n u^2 n s s

Le ss y conside n n

e co e e d e ence nd e e $d_{\mathbf{k}}^{j+1}$ nd $_{\mathbf{k}}^{j+1}$ e en dd $_{\mathbf{k}}^{j+1}$ o $_{\mathbf{k}}^{j+1}$ efo e e nd n e cco d n o e fo o n y d e e

$$\{\,_{\mathbf{k}}^{1}\} \longrightarrow \{\,_{\mathbf{k}}^{2}\} \longrightarrow \{\,_{\mathbf{k}}^{2}\} \quad \{\,_{\mathbf{k}}^{2}\} \longrightarrow \{\,_{\mathbf{k}}^{3}\} \longrightarrow \{\,_{\mathbf{k}}^{3}\} \quad \{\,_{\mathbf{k}}^{3}\} \cdots$$

$$\{d_{\mathbf{k}}^{2}\} \longrightarrow \{d_{\mathbf{k}}^{2}\} \quad \{d_{\mathbf{k}}^{2}\} \qquad \{d_{\mathbf{k}}^{3}\} \longrightarrow \{d_{\mathbf{k}}^{3}\} \quad \{d_{\mathbf{k}}^{3}\} \cdots$$

e fo fo e n e d e ence nd e e $d_{\mathbf{k}}^{j+1}$ nd $_{\mathbf{k}}^{j+1}$ y e fo nd n A e e co e $d_{\mathbf{k}}^{j}$ M M e $d_{\mathbf{k}}^{1}$ nd $_{\mathbf{k}}^{n}$ nd o n

$$^{2}_{0} \sum_{j=1}^{j=n} \sum_{\mathbf{k}\in\mathbf{Z}} d_{\mathbf{k}}^{j} \quad d_{\mathbf{k}}^{j} \quad _{\mathbf{k}}^{j} \quad \sum_{\mathbf{k}\in\mathbf{Z}} \,_{\mathbf{k}}^{n} \quad _{\mathbf{k}}^{n} \quad _{\mathbf{k}}^{n} \quad _{\mathbf{k}}^{n}$$

ce en e of o e on fo co n e e n on of $^{2}_{0}$ o o on o en e of n c n coe c en $d_{\mathbf{k}}^{j}$ n e e e e n on of $_{0}$ n e o c e e o n nc on e e en ed y ec o of e en N en en e of o e on o o on o N e o n nc on e e en ed y o $_{2}N$ n c n coe c en en en e of o e on o co e o e o o on o o $_{2}N$ e o n e e y ene ze o e d en on c e

O n u^2 n s s

e no e n o e ene c of e e nd de e n o o e nd n o e ee n e n e c of e od c on en e o e n o e ne e nd e de e o n e c en o o nde o e e co c y o ed e e o o con de on e no e c ed o e e e deno e e n nc on y nd e e e y e e e en en y $_{\mathbf{k}}^{j}$ $-j=2$ $-j$ $-$ $M \in \mathbf{Z}$ e e con de e e on n y oc ed

n o de o e nde e n n o e e e e e ed o con de e n e of e od c of e nc on fo e e

$$M_{\mathbf{www}}^{j;j'}(M'M) \quad \int_{-\infty}^{+\infty} \,_{\mathbf{k}}^{j} \quad _{\mathbf{k}'}^{j} \quad _{\mathbf{l}}^{j'} \, d\,M$$

e e $' \leq$ c e e coe c en $M_{\mathbf{www}}^{j;j'}(M'M)$ e den c y ze o fo $| - '|$ $_{0}$ e e $_{0}$ de end on e o e of e o of e nc on en e of nece y coe c en y e ed ced e y o e n

$$M_{\mathbf{www}}^{j;j'}(M'M) \quad -j'=2 \int_{-\infty}^{+\infty} \,_{0}^{j-j'} \quad _{\mathbf{k}-\mathbf{k}'}^{j-j'} \quad ^{0}_{2^{j-j'}\mathbf{k}-\mathbf{l}} \, d\,M$$

o e o de e nd o e y e of ne e on o find M_0 M e d oc e d e en o o e e n e ne ec on

Le no e n e e on fo con de n nd n n e en e oced e of f n e o ec on no ne ce cco ed y e y d econ c on o ee e

Le e on y n e of coe c en of e o e e e o d of cc cy e no e ee e fo on y o coe c en of con e o e od c o e e e o d need o e e n f c one y con de e f nc on n se d of s s c en o con s de e n

$$\mathbf{V}_0 \times \mathbf{V}_0 \to \mathbf{V}_0$$

se y o s ee fo $\in \mathbf{V}_0$

$$\sum_{\mathbf{k}} \mathbf{k} \; - \; M$$

e es of n e e o n s y e d d s d s

References

Bey n e e M e o on n y s nd s N c A o A *dr f of N A Lec re No e*

Bey n n e e e n on of o e o s n s of co c y s o ed e e s *AM N er An* o e

Bey n o f n nd o n s e e n fo nd n c o *Co P re nd App M* Y e n e y e n c e o YAL A

M Bony n e c on de s n e o e e on de ee non ne e e A e non ne e s e e d n f d ee N e d d on d o