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[illegible]

[illegible]

I Introduction

[illegible]

[illegible]

n e e dd e e o e of o n e c on of f nc on n e e e e e con de co n 2 n e e e nce e od c of o f nc on y e en $\frac{1}{4}$ 2 − − 2

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

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

e e ${}^{j}_{k}$ $-j=2$ $-j$ − e e f nc on e co n $c^{j;j';m}_{k;k';l}$ does no e en o e e n e of e nonze o of coe c en e nd e o n e n e of o e on o co e 2 o o on o N_s^3 e e N_s e n e of n c n coe c en n e e en on of

n n e of c on e f nc on of n e e e f nc on e n o o o y fe oc on e n e of n c n e e coe c en of f nc on one e e N_s o o on o o

II Multiresolution algorithm for evaluating u

nco n n c on n sc s

Le s con s de e o ec on s of $\in \mathbf{L}^2(\mathbf{R})$ on s ce s $\mathbf{V_j}$

$$\mathbf{j} \quad \mathbf{j} \quad \mathbf{j} \in \mathbf{V_j}$$

e e $\{\mathbf{V_j}\}_{\mathbf{j}\in\mathbf{Z}}$ 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 s e s e e e e s co c s e s

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

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

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

o

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

o n u^2 n s s

Le ss y con s de n n

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

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

$$\searrow \qquad \searrow \qquad \searrow$$

$$\{d^{2}_{k}\} \longrightarrow \{d^{2}_{k}\} \quad \{d^{2}_{k}\} \qquad \{d^{3}_{k}\} \longrightarrow \{d^{3}_{k}\} \quad \{d^{3}_{k}\} \cdots$$

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

$$^{2}_{0} \sum_{j=1}^{j=n} \sum_{k \in Z} d^{j}_{k} \quad d^{j}_{k} \quad ^{j}_{k} \qquad \sum_{k \in Z} \ ^{n}_{k} \quad ^{n}_{k} \quad ^{n}_{k} \quad ^{n}_{k}$$

c e en e of o e on fo co n e n on of $^{2}_{0}$ o o on o en e of n c n coe c en d^{j}_{k} 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 e n 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 e n e of o e on o co e 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 e e 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 en en y $^{j}_{k}$ $-j/2$ $-j$ $-$ $\in$ **Z** e e con de e e o 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

$$M^{j;j'}_{WWW} \quad ' \qquad \int_{-\infty}^{+\infty} \ ^{j}_{k} \quad ^{j}_{k'} \quad ^{j'}_{l} \ d$$

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

$$M^{j;j'}_{WWW} \quad ' \qquad ^{-j'/2} \int_{-\infty}^{+\infty} \ ^{j-j'}_{0} \quad ^{j-j'}_{k-k'} \quad ^{0}_{2^{j-j'}k-l} \ d$$

o s s e e o de e nd o e y s e of ne e on s o f nd
M_0 e d oc e d e en o o o e e n e ne s ec on

Le s no e n e e on s fo con s de n nd s n s n en s e e oced e of f n e o ec on s j j n o f ne s ce s cco s ed y e y d econ s c on o s e e 3

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

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

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

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

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

References

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

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

Bey n o f n nd o n 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 n e o e e on de ee non ne e e A e non ne e e e d n f d ee N e d d on d d o