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I Introduction

n e e dd e e o e of on 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

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

e e ${}^{j}_{k}$ $-j=2$ $-j$ − e e f nc on e co n $c^{j;j';m}_{k;k';l}$ doe 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 on e e N_s o o on o o

II Multiresolution algorithm for evaluating u

nco n n c on n sc s

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

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

e e $\{\mathbf{V_j}\}_{\mathbf{j}\in\mathbf{Z}}$ s e o on n y 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 e s

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

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

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

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 s s y con s de n n e e of n e s s e e e fo o n e c e on s

$$\mathbf{j}\ \mathbf{k}\ {}^{2} \quad {}^{-\mathbf{j}=2}\ \mathbf{j}\ \mathbf{k}\ M$$
$$\mathbf{j}\ \mathbf{k}\ {}^{2} \quad {}^{-\mathbf{j}=2}\ \mathbf{j}\ \mathbf{k}\ M$$
$$\mathbf{j}\ \mathbf{k} \quad \mathbf{j}\ \mathbf{k} \quad {}^{-\mathbf{j}=2}\ \mathbf{j}\ \mathbf{k}\ M$$

e e $\mathbf{j}\ \mathbf{k}$ ${}^{-\mathbf{j}=2}$ ${}^{-\mathbf{j}}$ − $\mathbf{j}\ \mathbf{k}$ ${}^{-\mathbf{j}=2}$ ${}^{-\mathbf{j}}$ − s e c e s c f nc on of e n e M nd s e f nc on − − nd n $_0$ n o e s s

$$_0 \quad \sum_{\mathbf{j}=1}^{\mathbf{j}=\mathbf{n}} \sum_{\mathbf{k}\in\mathbf{Z}} d^{\mathbf{j}}_{\mathbf{k}}\ \mathbf{j}\ \mathbf{k} \quad \sum_{\mathbf{k}\in\mathbf{Z}}\ \mathbf{n}\ \mathbf{k}\ \mathbf{n}\ \mathbf{k}\ M$$

nd s n

e e co e e d e ence nd e e d_k^{j+1} nd $_k^{j+1}$ e en dd $_k^{j+1}$ o $_k^{j+1}$ e fo e e nd n e cco d n o e fo o n y d e e

$$\{\ _k^1\} \longrightarrow \{\ _k^2\} \longrightarrow \{\ _k^2\} \quad \{\ _k^2\} \longrightarrow \{\ _k^3\} \longrightarrow \{\ _k^3\} \quad \{\ _k^3\} \cdots$$

$$\{d_k^2\} \longrightarrow \{d_k^2\} \quad \{d_k^2\} \qquad \{d_k^3\} \longrightarrow \{d_k^3\} \quad \{d_k^3\} \cdots$$

e fo fo e n e d e ence nd e e d_k^{j+1} nd $_k^{j+1}$ y e fo nd n A e e co e d_k^j M M e d_k^1 nd $_k^n$ nd o n

$$^2_0 \quad \sum_{j=1}^{j=n} \sum_{k \in Z} d_k^j \quad d_k^j \quad _k^j \quad \sum_{k \in Z} \ _k^n \quad _k^n \quad _k^n \quad _k^n$$

c e e n e of o e on fo co n e n on of $^2_0$ o o on o e n e of n c n coe c en d_k^j n e e e e n on of $_0$ n e o c e f e o n f 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 f e o n f nc on e e en ed y o $_2N$ n c n coe c en en e n e of o e on o co e e o o on o o $_2N$ 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 e od c on en e o e n o e ne e nd e de e o n e c en o o nd e 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 f nc on y nd e e e y e e e en en y $_k^j$ $^{-j=2}$ $-j$ $-$ $M \in \mathbf{Z}$ e e con de e e on n y oc ed

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

$$M_{www}^{j;j'}\ M'M \quad \int_{-\infty}^{+\infty} \ _k^j \quad _{k'}^j \quad _l^{j'} \quad d\ M$$

e e $' \leq$ c e e coe c en $M_{www}^{j;j'}\ M'M$ e den c y ze o fo $| - '| \quad _0$ e e $_0$ de end on e o e of e o of e f nc on e n e of nece y coe c en y e ed ced f e y o e n

$$M_{www}^{j;j'}\ M'M \qquad ^{-j'=2} \int_{-\infty}^{+\infty} \ _0^{j-j'} \quad _{k-k'}^{j-j'} \quad _{2^{j-j'}k-l}^{0} \quad d\ M$$

[illegible] o [illegible] e [illegible] e o de [illegible] e nd [illegible] o e [illegible] y [illegible] e [illegible] of [illegible] ne e [illegible] on [illegible] o f [illegible] nd M_0 [illegible] M [illegible] e d oc e d [illegible] e en [illegible] o [illegible] o e e [illegible] n [illegible] e ne [illegible] ec [illegible] on

Le [illegible] no e [illegible] n [illegible] e e [illegible] on [illegible] fo con [illegible] de [illegible] n [illegible] nd [illegible] n [illegible] n [illegible] en [illegible] e [illegible] e [illegible] oced e of [illegible] f [illegible] n [illegible] e [illegible] o ec [illegible] on [illegible] j j [illegible] n o [illegible] ne [illegible] ce [illegible] cco [illegible] ed y [illegible] e [illegible] y [illegible] d econ [illegible] c [illegible] on o [illegible] ee e [illegible] Le [illegible] e [illegible] on y [illegible] n [illegible] e of [illegible] coe c [illegible] en [illegible] of j e o e [illegible] e [illegible] e [illegible] o d of cc cy e no e [illegible] ee e [illegible] fo [illegible] on y [illegible] o [illegible] coe c [illegible] en [illegible] of j [illegible] con [illegible] e o [illegible] e [illegible] od c [illegible] j [illegible] j [illegible] o e [illegible] e [illegible] e [illegible] o d need o e e [illegible] n f c one [illegible] y con [illegible] de [illegible] e f nc [illegible] on nse d of s s c en o consde e n

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

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

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

e esof n e e on 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