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I Introduction

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[redacted] cation of function in
[redacted] e
[redacted] tten as $-\frac{1}{4}[(\ +\ )^2 - (\ -\ )^2]$.
[redacted] ting the
[redacted] e
[redacted] e coefficient

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

[redacted] computing $c^{j;j';m}_{k;k';l}$ does
[redacted] at
[redacted] to N_s^2, where
[redacted] entation of .
[redacted] at are
[redacted] wavelet coefficient
[redacted] at N_s [redacted] to

II Multiresolution algorithm for evaluating u

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[redacted] on , ace $\mathbf{V_j}$,

$$ j \quad j \in \mathbf{V_j} \qquad .1) $$

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$$ {}^2_0 - {}^2_{\mathbf{n}} - \sum_{\mathbf{j}=1}^{\mathbf{j}=\mathbf{n}} \Big[\ _{\mathbf{j}-1} \ )^2 - \ _{\mathbf{j}} \ )^2 \Big] - \sum_{\mathbf{j}=1}^{\mathbf{j}=\mathbf{n}} \ _{\mathbf{j}-1} + \ _{\mathbf{j}} \ ) \ _{\mathbf{j}-1} - \ _{\mathbf{j}} \ ) \qquad . \ ) $$

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

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$$ {}^2_0 - \sum_{\mathbf{j}=1}^{\mathbf{j}=\mathbf{n}} \ _{\mathbf{j}} \ ) \ _{\mathbf{j}} \ ) + $$

o n u^2 n s s

Let ta t y con de ng an

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$$\begin{array}{ccccccccc}
\{\hat{}^1_{\mathbf{k}}\} & \longrightarrow & \{{}^2_{\mathbf{k}}\} & \longrightarrow & \{{}^2_{\mathbf{k}}\}+\{\hat{}^2_{\mathbf{k}}\} & \longrightarrow & \{{}^3_{\mathbf{k}}\} & \longrightarrow & \{{}^3_{\mathbf{k}}\}+\{\hat{}^3_{\mathbf{k}}\} \;\cdots \\
 & \searrow & & & & \searrow & & & \searrow \\
 & & \{d^2_{\mathbf{k}}\} & \longrightarrow & \{d^2_{\mathbf{k}}\}+\{\hat{d}^2_{\mathbf{k}}\} & & \{d^3_{\mathbf{k}}\} & \longrightarrow & \{d^3_{\mathbf{k}}\}+\{\hat{d}^3_{\mathbf{k}}\} \;\cdots
\end{array} \qquad (3)$$

[redacted] e fo nd n
[redacted] n, e et $d_{\mathbf{k}} = 0$) and ${}^n_{\mathbf{k}}$ and o tain

$$^2_0(\,) = \sum_{j=1}^{j=n}\sum_{\mathbf{k}\in\mathbf{Z}}(\hat{d}^j_{\mathbf{k}} + d^j_{\mathbf{k}})\;{}^j_{\mathbf{k}}(\,) + \sum_{\mathbf{k}\in\mathbf{Z}}({}^n_{\mathbf{k}} + \hat{}^n_{\mathbf{k}} + \hat{\hat{}}^n_{\mathbf{k}})\,\lambda^n_{\mathbf{k}}(\,) \qquad (4)$$

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o n u^2 n s s

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[redacted] en g en y ${}^j_{\mathbf{k}}(\,) = {}^{-j/2}({}^{-j} - \,)$, $\in \mathbf{Z}$ ee [8]). e
[redacted] e

$$M^{j,j'}_{\mathbf{www}}(\,') = \int_{-\infty}^{+\infty} {}^j_{\mathbf{k}}(\,)\;{}^j_{\mathbf{k}'}(\,)\;{}^{j'}_{\mathbf{l}}(\,)\,d \qquad (5)$$

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[redacted] at

$$M^{j,j'}_{\mathbf{www}}(\,') = {}^{-j'/2}\int_{-\infty}^{+\infty} {}^{j-j'}_0(\,)\;{}^{j-j'}_{\mathbf{k}-\mathbf{k}'}(\,)\;{}^0_{2^{j-j'}\mathbf{k}-\mathbf{l}}(\,)\,d \qquad (6)$$

[redacted] o t at

$$M^{\mathbf{j;j'}}_{\mathbf{WWW}} \quad ' \quad) = \quad ^{-\mathbf{j'}=2} \tilde{M}^{\mathbf{j-j'}}_{\mathbf{WWW}} \quad - \quad ' \quad \mathbf{j-j'} \quad - \quad) \qquad)$$

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$$\tilde{M}^{\mathbf{r}}_{\mathbf{WWW}} \quad - \quad ' \quad \mathbf{r} \quad - \quad) = \quad ^{-\mathbf{r}} \int_{-\infty}^{+\infty} \quad ^{-\mathbf{r}} \quad) \quad ^{-\mathbf{r}} \quad - \quad + \quad ') \quad - \quad \mathbf{r} \quad + \quad) \, d \qquad 8)$$

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$$|\tilde{M}^{\mathbf{r}}_{\mathbf{WWW}} \quad - \quad ' \quad \mathbf{r} \quad - \quad)| \leq C \quad ^{-\mathbf{r} \quad \mathbf{M}} \qquad 9)$$

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$$M^{\mathbf{j}}_{\mathbf{VW}} : \mathbf{V_j} \times \mathbf{W_j} \to \mathbf{V_j} \bigoplus_{\mathbf{j_0 \leq j' \leq j}} \mathbf{W_{j'}} \qquad . \; 0)$$

and

$$M^{\mathbf{j}}_{\mathbf{WW}} : \mathbf{W_j} \times \mathbf{W_j} \to \mathbf{V_j} \bigoplus_{\mathbf{j_0 \leq j' \leq j}} \mathbf{W_{j'}} \qquad . \;)$$

nce

$$\mathbf{V_j} \bigoplus_{\mathbf{j_0 \leq j' \leq j}} \mathbf{W_{j'}} = \mathbf{V_{j_0-1}} \qquad . \;)$$

and

$$\mathbf{V_j} \subset \mathbf{V_{j_0-1}} \qquad \mathbf{W_j} \subset \mathbf{V_{j_0-1}} \qquad . \; 3)$$

[redacted] .) on $\mathbf{V_{j_0-1}} \times \mathbf{V_{j_0-1}}$. o t e

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$$\mathbf{V_{j_0-1}} \times \mathbf{V_{j_0-1}} \to \mathbf{V_{j_0-1}} \qquad . \; 4)$$

[redacted] e m a ng . 0) and .). ndeed,

[redacted] e coe c ent

$$M \quad ' \quad) = \quad ^{-\mathbf{j}=2} \int_{-\infty}^{+\infty} \quad - \quad) \quad - \quad ') \quad - \quad) \, d \qquad . \; 5)$$

[redacted] e e

$$M_0 \quad) = \int_{-\infty}^{+\infty} \quad - \quad) \quad - \quad) \quad) \, d \qquad . \; 6)$$

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[redacted] . 0) and .) a ng [redacted] o ect on j , j nto a [redacted] ee e.g. [3]).

[redacted] o d [redacted] o e coe c ent of [redacted]) need to e t.

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[redacted] in tead of . 4), it i [redacted] e ent to con ide t e m a ing

$$\mathbf{V}_0 \times \mathbf{V}_0 \to \mathbf{V}_0 \qquad (. \;)$$

[redacted] it i ea y to ee t at fo $\in \mathbf{V}_0$,

$$) - \sum_{\mathbf{k}} \mathbf{k} \; - \;) \qquad (. 8)$$

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