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**Algorithm 1** Spatial Entropy Calculation for Feature Maps
 

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**Input:**  $\mathbf{F} \in \mathbb{R}^{B \times C \times H \times W}$  {Feature map}

- 1: Preprocess and reshape  $\mathbf{F}$  to  $\mathbf{F} \in \mathbb{R}^{B \times C \times N}$  where  $N = H \times W$  { $N$ : spatial dimensions}
- 2:  $\boldsymbol{\mu} \leftarrow \mathbb{E}[\mathbf{F}]_N$
- 3:  $\boldsymbol{\sigma} \leftarrow \sqrt{\mathbb{V}[\mathbf{F}]_N}$
- 4:  $\varepsilon \leftarrow \max(\min(\boldsymbol{\sigma}) \cdot 10^{-2}, 10^{-6})$
- 5:  $\hat{\mathbf{F}} \leftarrow \frac{\mathbf{F} - \boldsymbol{\mu}}{\boldsymbol{\sigma} + \varepsilon}$
- 6:  $\mathbf{F}^* \leftarrow \hat{\mathbf{F}} - \max(\hat{\mathbf{F}})_N$
- 7:  $\mathbf{P} \leftarrow \frac{\exp(\mathbf{F}^*)}{\sum_{n=1}^N \exp(\mathbf{F}_n^*) + \varepsilon}$  {Normalized probability distribution}
- 8:  $\mathbf{P} \leftarrow \frac{\max(\mathbf{P}, \varepsilon)}{\sum_{n=1}^N \max(\mathbf{P}_n, \varepsilon)}$
- 9:  $\mathbf{H} \leftarrow -\sum_{n=1}^N \mathbf{P}_n \log(\mathbf{P}_n)$  {Entropy per channel}
- 10:  $\mathbf{P}_{sort} \leftarrow \text{sort}(\mathbf{P})_N$
- 11:  $\mathbf{L} \leftarrow \text{cumsum}(\mathbf{P}_{sort})_N$
- 12:  $\mathbf{G} \leftarrow 1 - \frac{2}{N} \sum_{i=1}^N \frac{i \cdot \mathbf{L}_i}{\sum_{j=1}^N \mathbf{P}_{sort,j}}$  {Gini coefficient}
- 13:  $\boldsymbol{\rho} \leftarrow \mathbf{0}_B$  {Channel correlation}
- 14: **if**  $C > 1$  **then**
- 15:   **for**  $b = 1$  **to**  $B$  **do**
- 16:      $\mathbf{R}_b \leftarrow \text{corr}(\mathbf{P}_b)$
- 17:      $\boldsymbol{\rho}_b \leftarrow \frac{1}{C(C-1)} \sum_{i \neq j} \mathbf{R}_{b,i,j}$
- 18:   **end for**
- 19: **end if**
- 20:  $\bar{H} \leftarrow \frac{1}{BC} \sum_{b=1}^B \sum_{c=1}^C \mathbf{H}_{b,c}$  {Mean spatial entropy}
- 21: **if**  $\bar{H} \notin \mathbb{R}$  **then**
- 22:    $\bar{H} \leftarrow 0$
- 23: **end if**

**Output:**  $\bar{H}$

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