# Corrections to "The Relevance Vector Machine Technique for Channel Equalization Application"

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We wish to make the following corrections to [1]. The likelihood (6) should be

$$p(\mathbf{t}|\mathbf{w},\boldsymbol{\alpha}) = \prod_{l=1}^{N} \left(f(y(\mathbf{r}_l))\right)^{(t_l+1)/2} \left(1 - f(y(\mathbf{r}_l))\right)^{(1-t_l)/2}$$

to take into account the nature of target $t_l \in \{\pm 1\}$. Accordingly, the cost function (9) becomes

$$J(\mathbf{w}|\mathbf{t},\boldsymbol{\alpha}) = \sum_{l=1}^{N} \left( \frac{\alpha_l w_l^2}{2} - \frac{t_l+1}{2} \log(f(y(\mathbf{r}_l))) - \frac{1-t_l}{2} \log(1 - f(y(\mathbf{r}_l))) \right),$$

and the gradient of $J$ with respect to $\mathbf{w}$ in (10) is modified to

$$\nabla J = \mathbf{A}\mathbf{w} + \mathbf{\Phi}^T \left( \mathbf{f} - \frac{1}{2} (\mathbf{t} + \mathbf{1}_N) \right)$$

with $\mathbf{1}_N = [1\ 1 \cdots 1]^T$. Theoretically, this should improve the results slightly since a small bias towards one class has been removed. We have re-run the simulation, and have found that the results obtained remain similar to those presented in [1].

## References

[1] S. Chen, S.R. Gunn and C.J. Harris, "The relevance vector machine technique for channel equalization application," *IEEE Trans. Neural Networks*, Vol.12, No.6, pp.1529–1532, Nov. 2001.