Dear editor:

I enclose a manuscript entitled "QAM Classification Methods by SVM Machine Learning for Improved Optical Interconnection", which I submit for possible publication in the Optics Communications. All of the authors agree to the submission of this paper.

The article includes 12 pages and 12 figures prepared using Microsoft Word Processing 2016 according to the journal's Instructions to Authors. We have provided all required supporting documentation.

The support vector machine (SVM) is used in optical interconnect systems to improve system nonlinear distortion due to the adaptive nonlinear decision boundary. We investigate the QAM multi-classification method based on SVM: the one versus one (OvO), the one versus rest (OvR), the binary tree (BT), especially the BT with different classification labels: the binary coding (BC), the constellation rows and columns (RC), the in-phase and quadrature components (IQC). Different classification methods have different performance in terms of classification precision and complexity. The precision mainly depends on the balance of data in each classification, the complexity depends on the number of SVMs and support vectors (SV) in training and SVM numbers in testing. We experimentally investigated four SVM multi-classification methods for machine learning assisted adaptive nonlinear mitigation, including the OvR, the BE, the CR, and the IQC. The comprehensive results show that the BT-SVM based on IQC has the lowest complexity with the similar bit error ratio (BER).

We respectfully submit that the following individuals would be suitable peer reviewers based on their expertise in the field:

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This work is supported by National Natural Science Foundation of China under Grant (61875124, 61875049, 61675128).

We thank you for considering this work and look forward to your response. Please direct all correspondence about this manuscript to Jiangbing Du. (Email: [dujiangbing@sjtu.edu.cn](mailto:dujiangbing@sjtu.edu.cn))

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