

Syst Biomed: Survival Regression by Data Fusion

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`<p style="text-align: justify;">`Our recent ``paper in Systems Biomedicine`` describes a new computational approach that predicts patient's survival time from a collection of heterogeneous data sets. This is the full paper of our ``award winning entry`` at ``CAMDA meeting at ISMB 2014, Boston, MA, USA``.`</p>` `<p style="text-align: justify;">`The approach builds upon recently proposed collective matrix factorization and a well-known Aalen's additive model for survival regression. Unlike existing methods for survival time prediction, we formulated a joint inference procedure that allows us to simultaneously infer model parameters of collective matrix factorization and regression coefficients of Aalen's model. We demonstrated improved performance of our method over several baselines in case studies involving three cancer types from ``the International Cancer Genome Consortium`` and diverse data sets, such as gene and miRNA expression profiles, somatic mutation data, methylation and gene annotations from the Gene Ontology. We demonstrate that both latent data representation and joint inference, the two features of our approach, contribute substantially to the accurate prediction of survival time. Our results allude to the potential benefits of data fusion when inferring survival models that are predictive of clinical outcomes.`</p>`