

Perbandingan Kinerja Model Regresi Cox-Proportional Hazard (Cox-PH), Model Random Survival Forest dan Model Gradient Boosting Survival Analysis pada Data Alzheimer = Performance Comparison of Cox-Proportional Hazard Regression Models (Cox-PH), Random Survival Forest Model and Gradient Boosting Survival Analysis towards Alzheimer's Data

Joan Bidadari Annandale, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=9999920551484&lokasi=lokal>

Abstrak

Penyakit Alzheimer adalah penyakit progresif yang dimulai dengan hilangnya ingatan ringan dan berkembang hingga hilangnya kemampuan bicara dan respon terhadap lingkungan. Penyakit ini belum dapat disembuhkan, dan pengobatan saat ini hanya berfungsi mengurangi gejala sementara. Oleh karena itu, penting untuk mengidentifikasi risiko utama pengembangan Alzheimer dan memberikan diagnosis yang tepat guna mendukung penelitian lebih lanjut. Model regresi Cox-Proportional Hazard sering digunakan untuk menangani data survival tersensor, tetapi saat ini, machine learning menunjukkan potensi besar. Dua model machine learning, Random Survival Forest dan Gradient Boosting Survival Analysis, mampu menangani data survival dan data tersensor tanpa memerlukan asumsi parameter. Kedua model ini juga menghindari overfitting dan lebih mudah diinterpretasi dibandingkan model non-parametrik lainnya. Hasil pada data Alzheimer menunjukkan bahwa Gradient Boosting Survival Analysis memiliki performa terbaik dengan nilai C-index 0.8503, diikuti oleh Random Survival Forest dengan nilai 0.8286. Model regresi Cox-PH memiliki kinerja terendah dengan nilai C-index 0.8092, dan data Alzheimer yang digunakan tidak memenuhi asumsi proportional hazard. Model Gradient Boosting Survival Analysis dan Random Survival Forest mengidentifikasi CDRSB dan FDG sebagai risiko terpenting, sedangkan model Cox-PH mengidentifikasi AV45 dan FDG.

.....Alzheimer's disease is a progressive disease that begins with mild memory loss and progresses to loss of speech and response to the environment. There is no cure for the disease, and current treatments only temporarily reduce symptoms. Therefore, it is important to identify the main risk factors for developing Alzheimer's and provide an accurate diagnosis to support further research. The Cox-Proportional Hazard regression model is often used to handle censored survival data, but currently, machine learning shows potential. Two machine learning models, Random Survival Forest and Gradient Boosting Survival Analysis, are able to handle survival data and censored data without requiring parameter assumptions. Both models also avoid overfitting and are easier to interpret than other non-parametric models. The results on Alzheimer's data show that Gradient Boosting Survival Analysis has the best performance with a C-index value of 0.8503, followed by Random Survival Forest with a value of 0.8286. The Cox-PH regression model has the lowest performance with a C-index value of 0.8092, and the data used does not meet the proportional hazard assumption. The Gradient Boosting Survival Analysis and Random Survival Forest models identified CDRSB and FDG as the most important risks, while the Cox-PH model identified AV45 and FDG.