

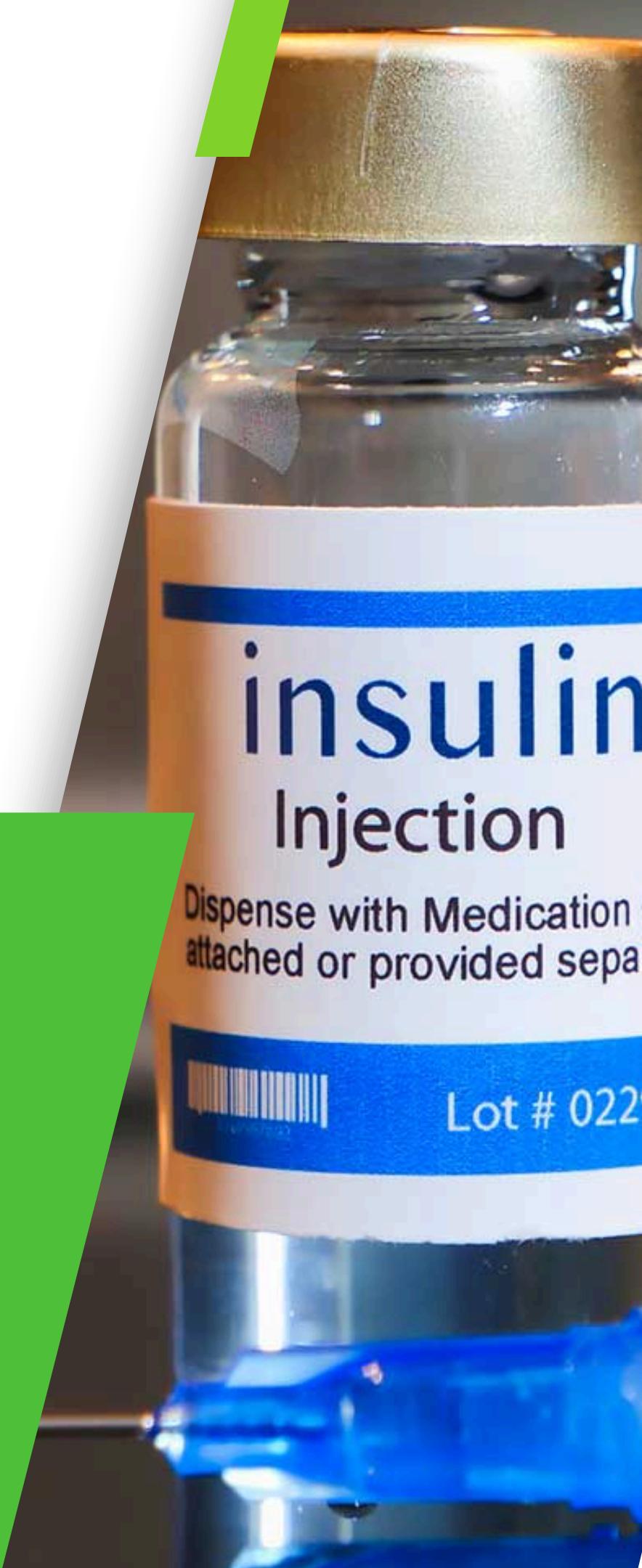
# **CASE STUDY 3**

## **Regression analysis in AI for insulin infusion**

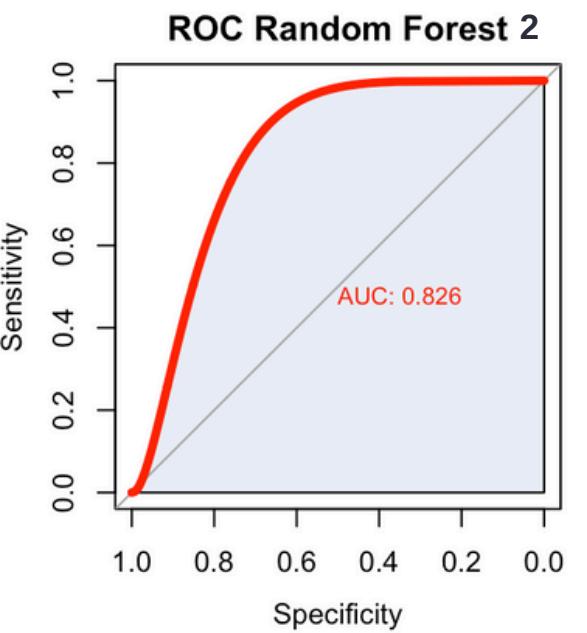
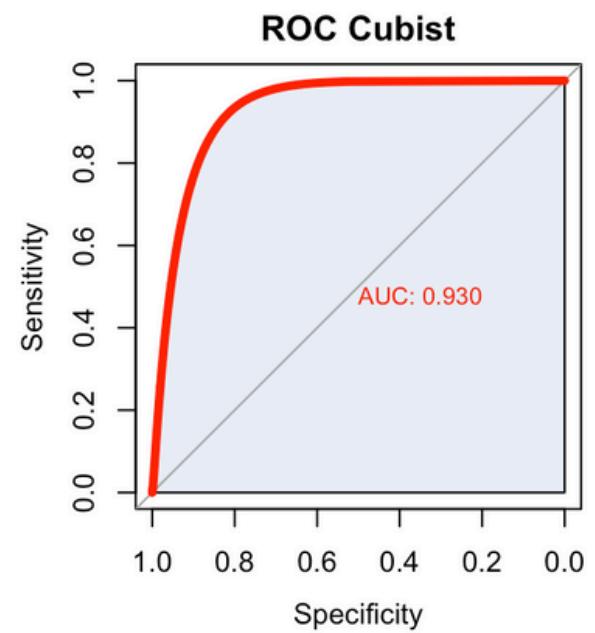
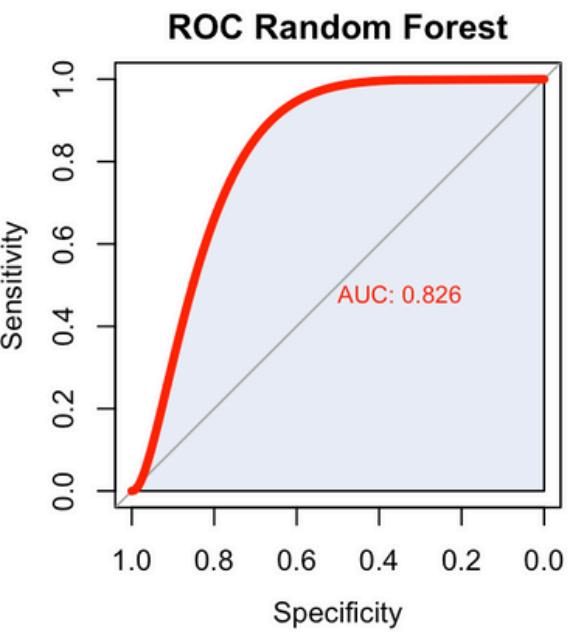
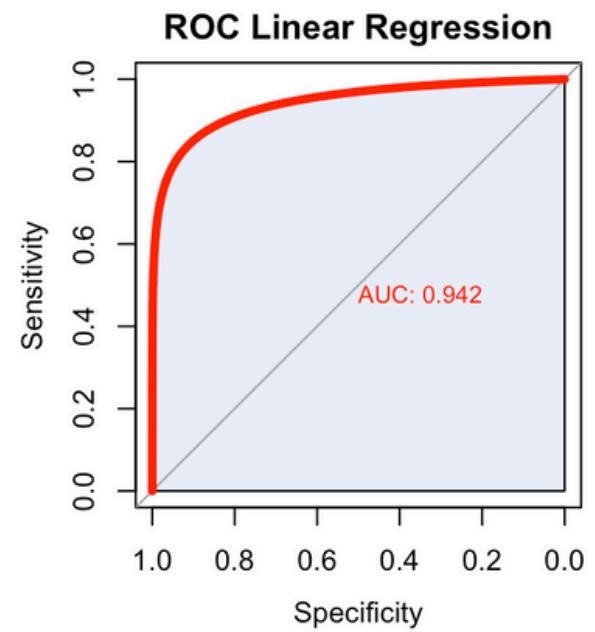
**TECHNOLOGICAL TRENDS**

# Process executed

1. Install and load required packages for data manipulation, time series analysis, ML models, etc
2. Set working directory, load the csv into a data frame and prepare data
3. Splitting data into 75% training and 25% testing sets
4. Training different regression models like the linear regression, random forest, cubist model, M5 model tree
5. Evaluates the residuals for each model and makes predictions on test data
6. Plotting prediction vs actual data
7. Printing summaries of each model
8. Generate ROC Curves and AUC, calculate MSE and compare MSE across models

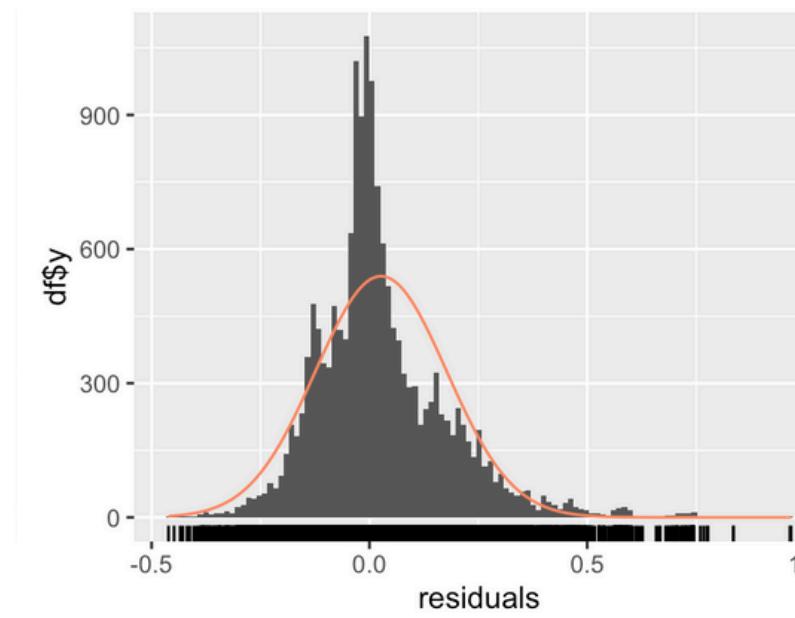


# Summary and graphs obtained

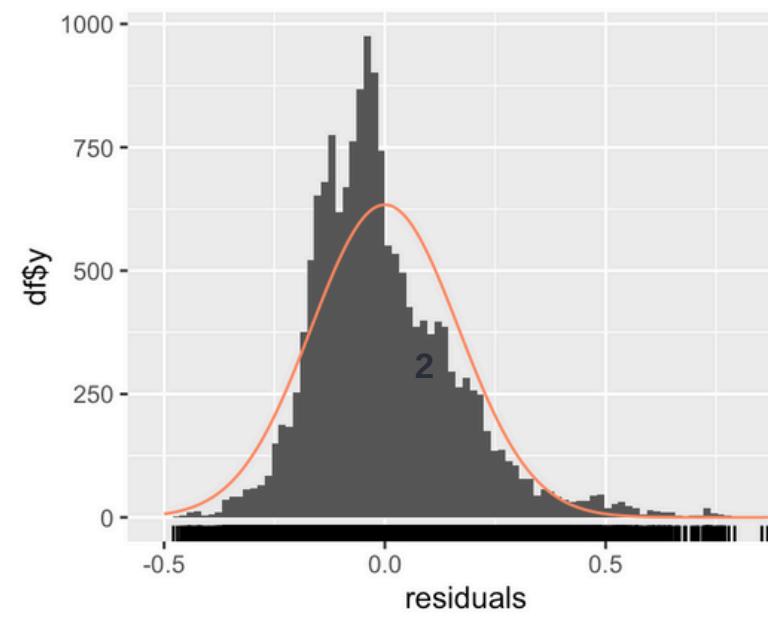


# Interpretation of results

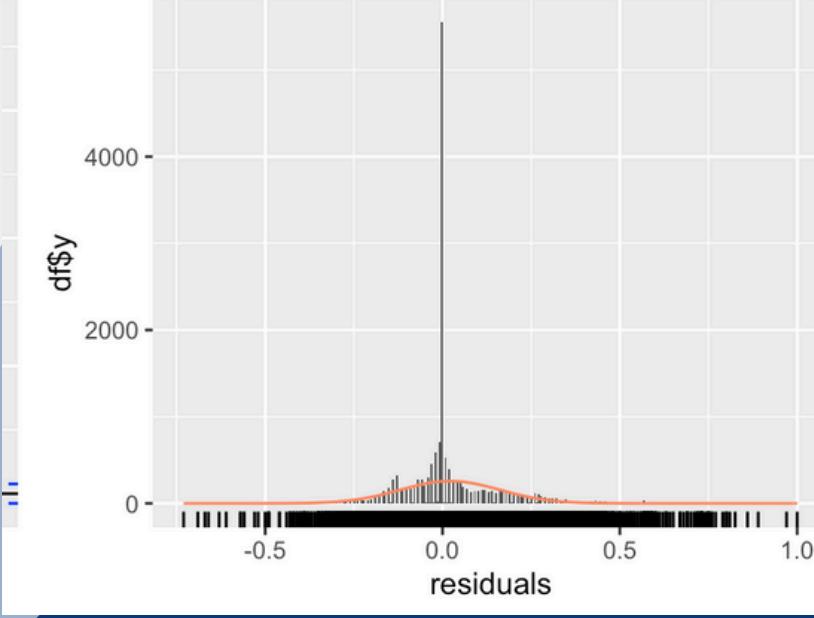
Cubist



Linear Regression



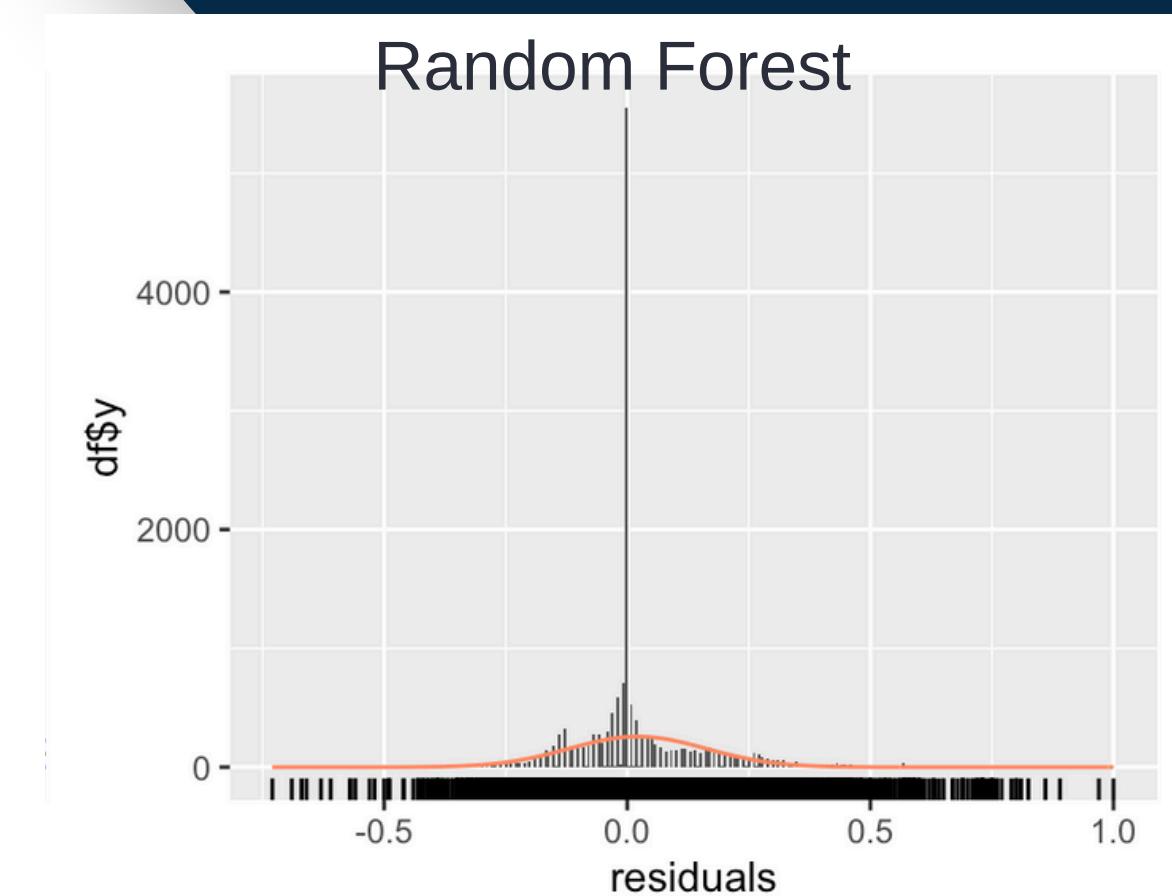
Random Forest



# Model to perform the calculation of the insulin infusion

In terms of residuals, Random Forest is the best model.

However, regarding ROC, **Linear Regression**.  
ROC gives a better accuracy, so Linear Regression is the model we would choose because of the execution time, ROC curve nearly 1-1 and AUC being the biggest number (0.942).



# Thanks!