

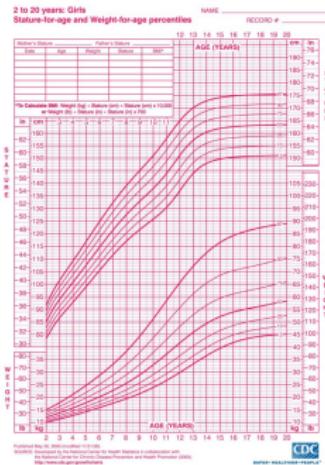
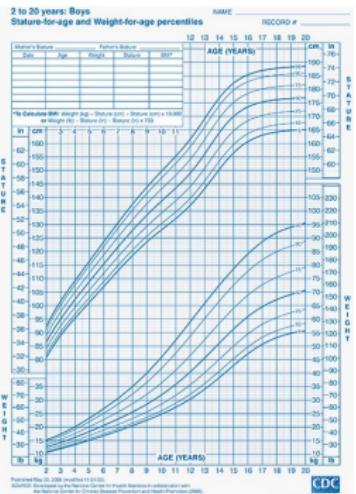
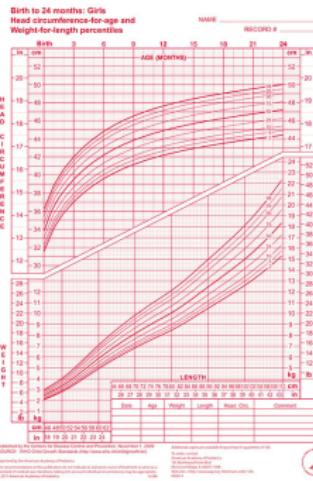
Introduction to data science & artificial intelligence (INF7100)

Arthur Charpentier

#341 Quantile Regression

été 2020

Quantile & Regression

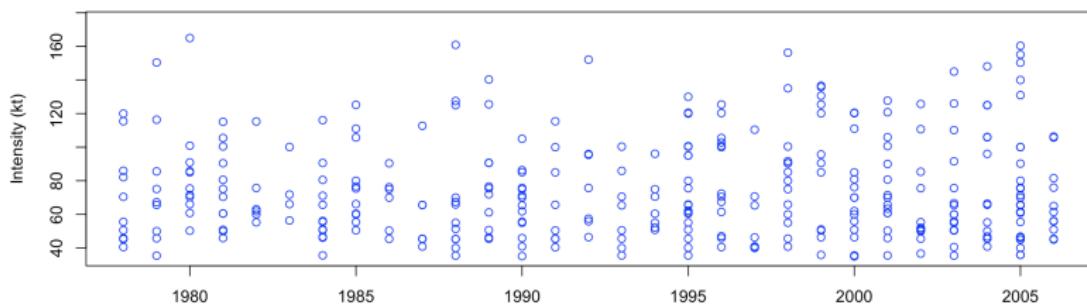


From **CDC Growth Charts**.

More Hurricanes ?

Jagger & Elsner (2008, [Modeling tropical cyclone intensity with quantile regression](#)) and Elsner, Kossin & Jagger,(2008, [The increasing intensity of the strongest tropical cyclones](#))

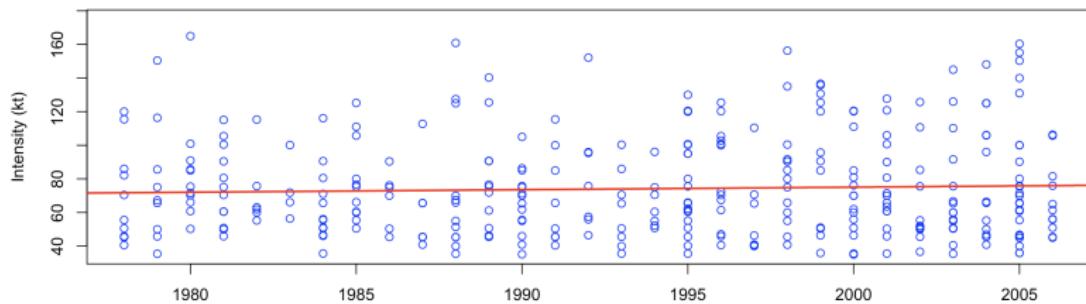
List of all hurricanes (and intensity) 1977-2007



More Hurricanes ?

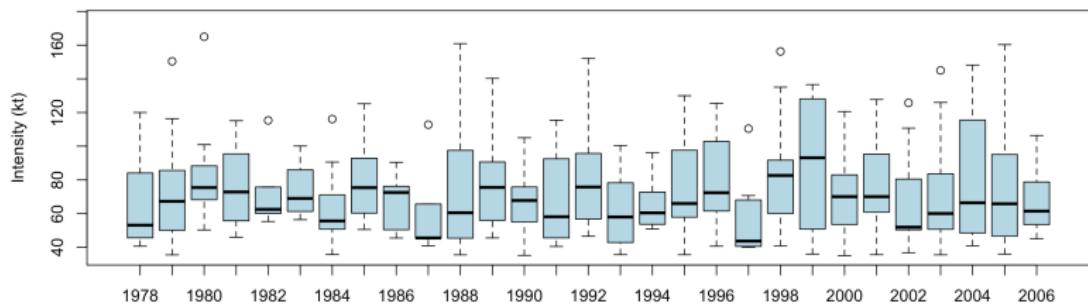
Jagger & Elsner (2008, [Modeling tropical cyclone intensity with quantile regression](#)) and Elsner, Kossin & Jagger,(2008, [The increasing intensity of the strongest tropical cyclones](#))

List of all hurricanes (and intensity) 1977-2007



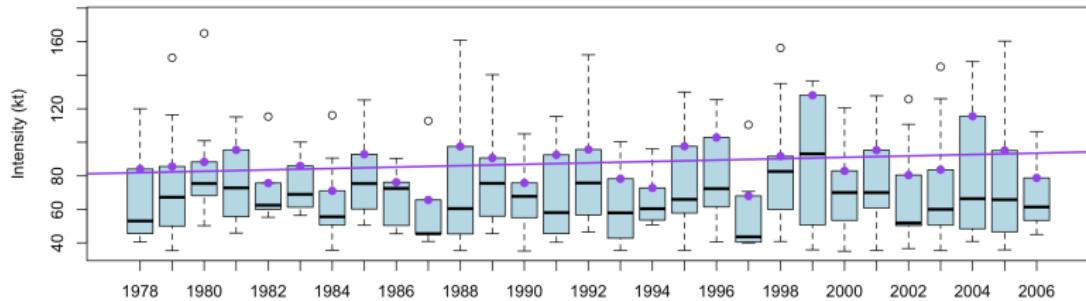
More Hurricanes ?

Use of yearly-box plots



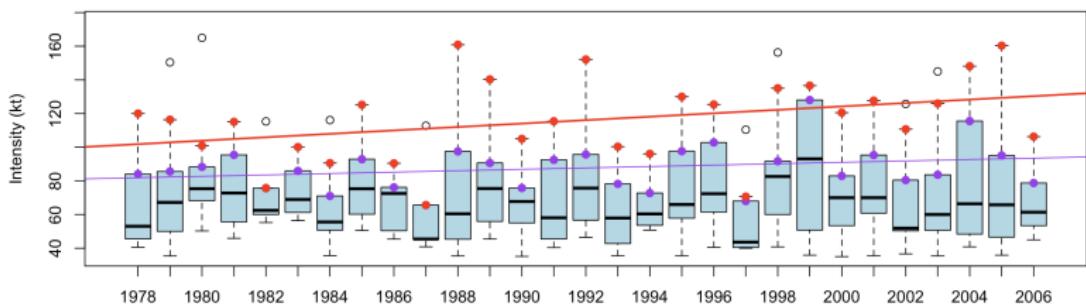
More Hurricanes ?

Use of yearly-box plots
with a regression of the 75% quantile (upper part of the box)



More Hurricanes ?

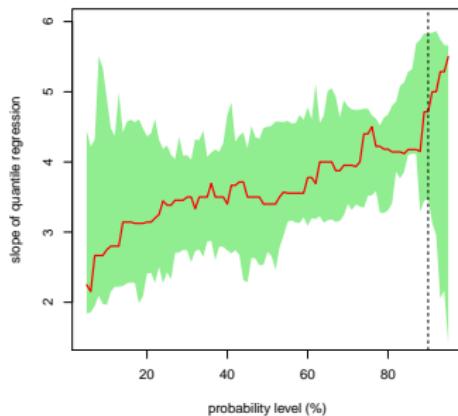
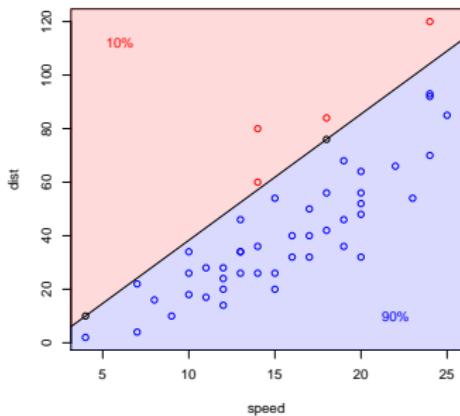
or the upper part of the moustache...



Quantile Regression

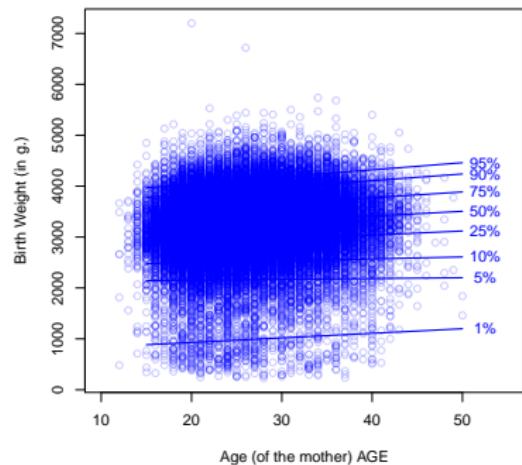
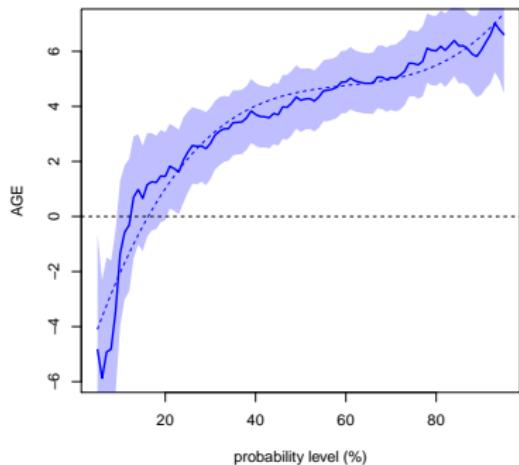
$$\mathcal{R}_\tau^q(u) = u \cdot (\tau - \mathbf{1}(u < 0)), \quad \tau \in [0, 1]$$

We want to solve, here, $\min \left\{ \sum_{i=1}^n \mathcal{R}_\tau^q(y_i - \mathbf{x}_i^\top \boldsymbol{\beta}) \right\}$



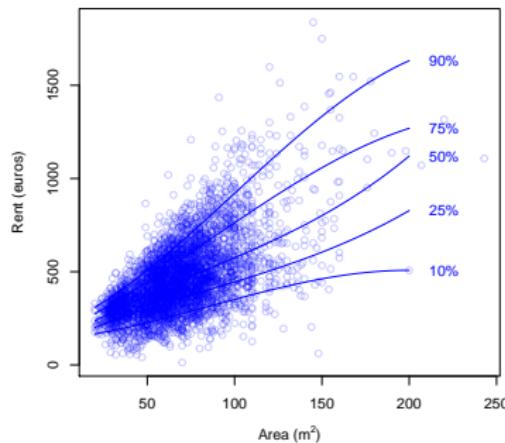
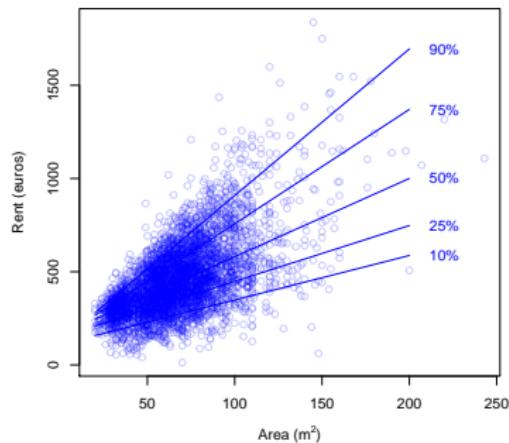
Quantile Regression

From `nativity2005.txt`



Quantile Regression

Rents in Munich, as a function of the area, from Regression:
Models, Methods and Applications
From rent98_00.txt



Quantile Regression

Rents in Munich, as a function of the year of construction, from
Regression: Models, Methods and Applications

