# Introducing LIST

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# LIST in a Nutshell

**LIST** is a **privately owned company** founded in Pisa in **1985**

LIST is **100%** focused on **Banking and Finance** and delivers solutions for:

**Capital Markets** and **Risk Management**

LIST **designs, develops & distributes** its own **technology**

A **product oriented** company

Innovative Industrial International

# LIST: Technology for the Financial Industry

Phone

Screen Trading


Algo Trading, A.I.

Financial Calculators

Spreadsheets

Networking, Internet, Intranet

**LIST's solutions**

- ✓ Electronic trading
- ✓ Treasury management
- ✓ Compliance
- ✓ Risk Management

Trading Pit

Electronic Platforms



LIST

# LIST global footprint

**List UK** · London
U.K. and Northern Europe

**List SpA** · Pisa ● (headquarters), Milan, Turin ●, Trieste, Siena, Voghera ●; Italy and EMEA

**List Inc.** · Toronto
Canada & North America

**List India** · Mumbai ●
India and Middle East

**List Iberica** · Madrid ●
Spain, Portugal
and South America

**List Polska** · Warsaw
Poland and Eastern Europe

**List Malaysia** · Kuala Lumpur ●
Malaysia, China and Far East

● *R&D departments*

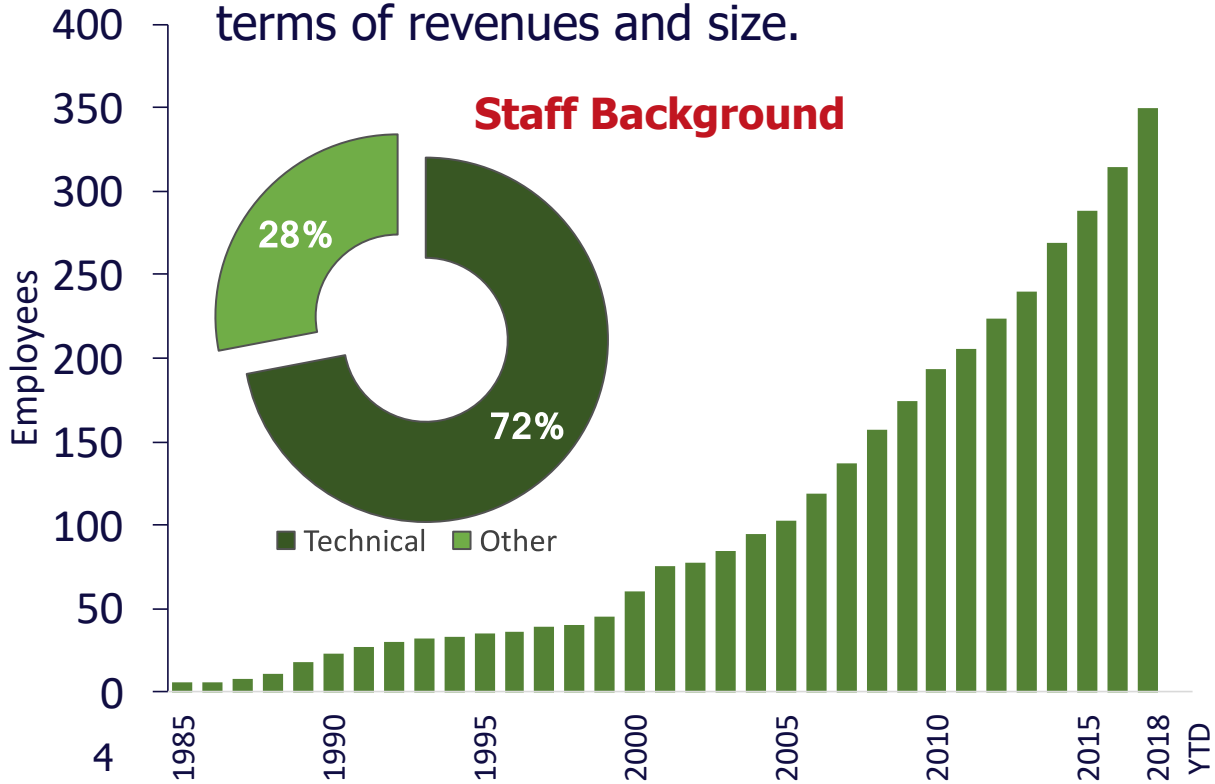
*Distributing partners in Israel, China and Taiwan*

# LIST in Figures

- **120+** customers in **18** countries and **3** continents
- **394 employees** in **13** premises worldwide

## A Growing Company

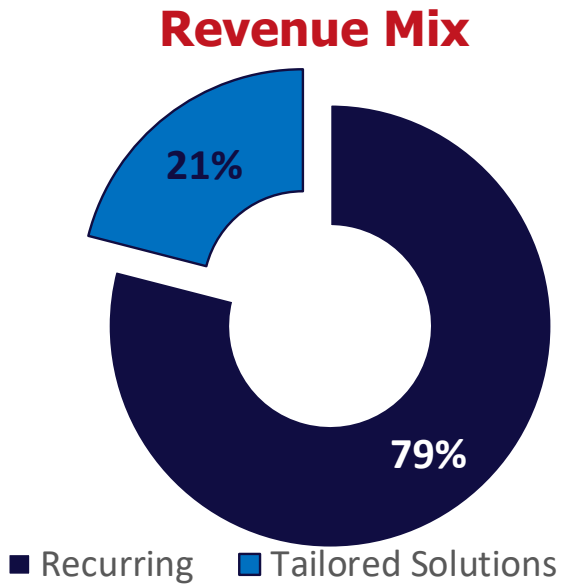
LIST has been steadily growing both in terms of revenues and size.




## Stable Revenue Structure

The majority of LIST's revenues is based on **recurring fees**.

**CAGR 2005-2017: 15.8%**




LIST

# Financial Engineering Team

# Financial Engineering

Who we are

- Physic: 50%
- Financial Economist: 20%
- Mathematics: 20%
- Engineers: 10%

Who we need

- Quantitative mindset & Mathematical background
- Interest in financial mathematics
- C++ programming skill
- Matlab, Python, MSExcel, R

What we do

- C++ Financial Libraries (pricing, analytics, risk)
- AI - Deep Learning Research for finance

# C++ Financial Libraries

Overview of technical and mathematical functionalities implemented in the List libraries

## Monte-Carlo

- multi-dimensional simulations
- Pseudo-Random Numbers (GFSR and RANLUX) and Quasi-Random Numbers (Sobol);
- Dimensionality Reduction (spectral decomposition); and Variance Reduction (antithetic sampling);
- Optimal Time Stopping (Andersen method and Longstaff-Schwartz).

## Optimization & Root finding

- are used for:
  - Calibrating parameters of stochastic differential equations;
  - Best fitting of financial data;
  - Solving high-order equations like yield to maturity calculation;
  - Implied Volatilities calculation.
- Least Squares, Brent, Newton Raphson, Levenberg Marquardt, Bisection, Secant.

## Numerical Trees

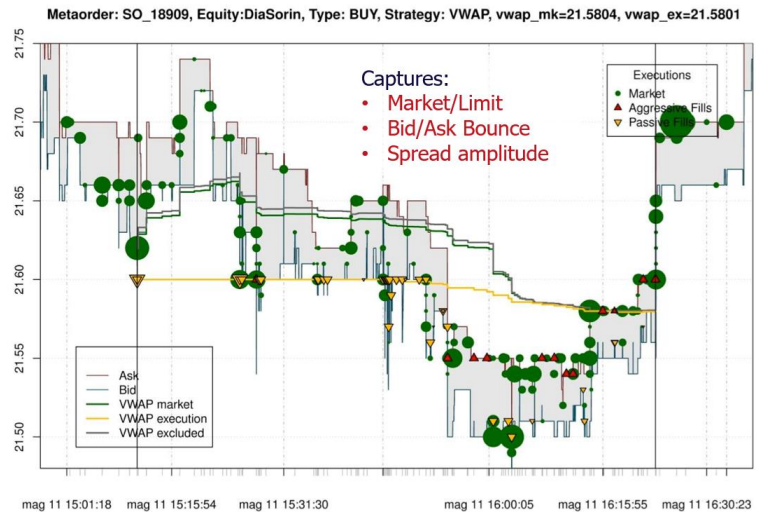
- alternative to Monte-Carlo simulations in order to discretizes the filtration on which underlying is defined.
- Deterministic Discretization (binomial and trinomial trees);
- Random Discretization (path integral between beginning and final states of underlying).

# Artificial Intelligence for financial data

## Deep Learning

- Forecasting of financial series
- Optimal execution of orders
- Anomaly detection

Example of of Care Order Execution Analysis




## AI Tools

- Neural networks
- TensorFlow by Google
- Python

https://www.tensorflow.org

# Grazie per l’attenzione

https://www.linkedin.com/company/list-spa

http://www.list-group.com

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