How Tellusant Works

Linear Algebra ∧ Calculus

$$\mathbf{y} = \mathbf{A}\mathbf{w} \qquad {}^{dy}/_{dx} = f(x, y)$$

Internal Training Session

by Dr. **Staffan Canback**
Executive Chairman

May 22, 2025

“Game development is

- **Linear algebra**
- **Trigonometry**

Jacob Canbäck
Game Developer Extraordinaire
Helsingborg, Christmas Eve 2024

What does this mean for **Tellusant**?

More broadly, we live in a world of

- **Linear algebra**
- **Calculus**

Which jointly, in due time, can solve every problem in the world

Central to linear algebra are **matrixes**

$$\mathbf{A} = \begin{array}{c} \\ 1 \\ 2 \\ 3 \\ \vdots \\ m \end{array} \begin{array}{c} \begin{array}{cccc} 1 & 2 & \cdots & n \end{array} \\ \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ a_{31} & a_{32} & \dots & a_{3n} \\ \vdots & \vdots & \vdots & \vdots \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{bmatrix} \end{array}$$

Matrix math governs gaming, search, econometrics, AI…and **Tellusant**

$\mathbf{y}$ = Outcome $\quad \mathbf{y} = \begin{bmatrix} y_1 \\ \vdots \\ y_m \end{bmatrix}$

$\mathbf{A}$ = Responses $\quad \mathbf{y} = \mathbf{A}\mathbf{w}$

$\mathbf{w}$ = Weights $\quad \mathbf{w} = \begin{bmatrix} w_1 \\ \vdots \\ w_n \end{bmatrix}$

Rotations and **eigenvalues** are central

As is **Principal Component Analysis** (PCA)

Calculus at Tellusant deals mainly with **differential equations**

Example: Tellusant S-curves

$$y'(x) - \eta \frac{y(x)}{x} + \delta y(x)^{\tau} = 0$$

This is the world **Tellusant** lives in, as we:

- Do statistical analyses
- Leverage ML and AI

} Same thing, different uses

- Create **TelluBase** and **PoluSim** algorithms
- Analyze economic and demographic data
- Find insights in survey data

There are three alternatives. To march at the head of the management science revolution. To trail behind with no bravery or distinction, as running dogs. Or to stand in its way and oppose it.
We choose the first.

Members of our company, be courageous, defy difficulties, and dare to win, customer upon customer.

Monsters of all kinds shall be destroyed.