AI & Predictability:
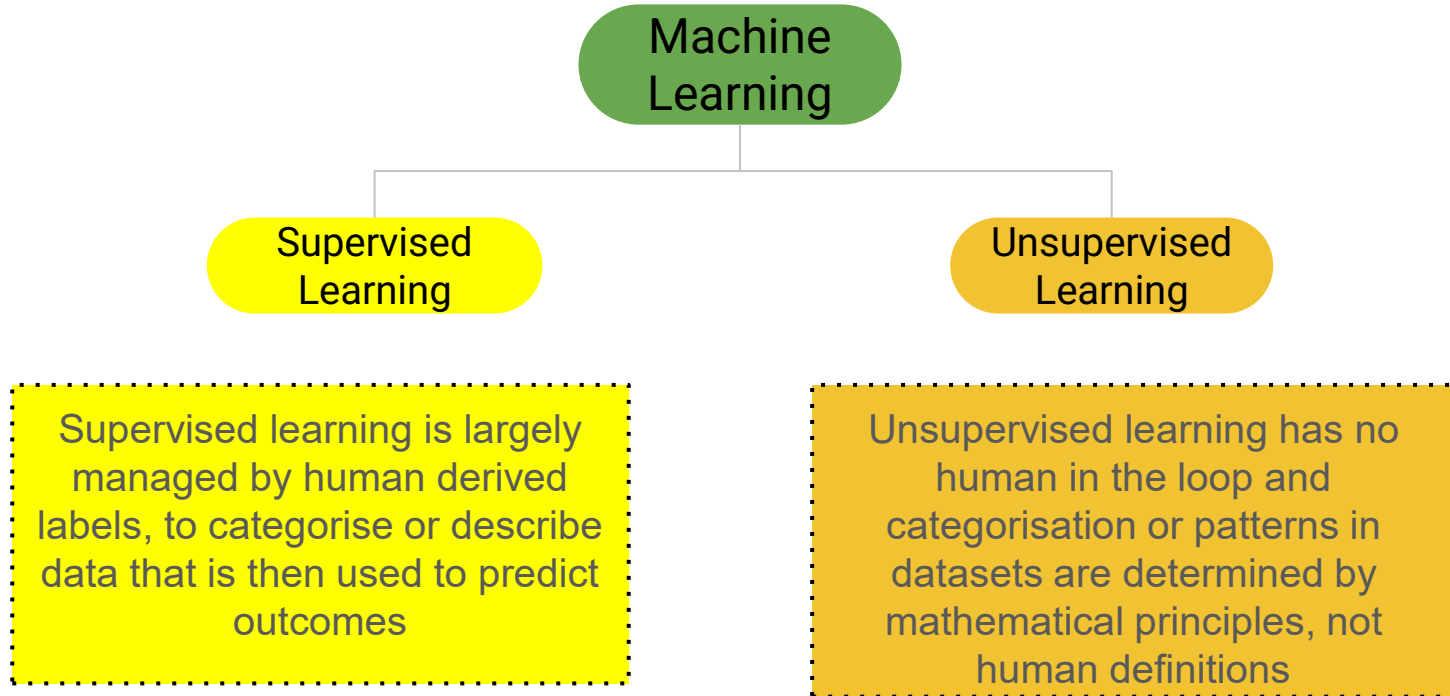## *Its role for healthier and happier living in later life*

Julia Glenn
04 December 2025
julia@aibydesign.ai

AI by Design

How AI is Being Used: Some Basic Principles for Context

Machine Learning

Supervised Learning

Unsupervised Learning

Supervised learning is largely managed by human derived labels, to categorise or describe data that is then used to predict outcomes

Unsupervised learning has no human in the loop and categorisation or patterns in datasets are determined by mathematical principles, not human definitions

AI by Design

Example - How AI is Being Used in Health & Social Care: Classification Models

Supervised learning classification models use labelled historical data to learn patterns and then **predict which category or outcome a new case is most likely to fall into**, helping eg councils identify risks earlier and target support more effectively.

- Some local authorities have started to use classification models to assign a case to a *likely* outcome group so that they can better use resources to manage care packages, hospital admissions etc.

- The intention is to predict risk/demand and to inform human decision making

AI by Design

The Birth of Classification Models in LA/Social Care Context

Classification modelling experimentation and implementation by local authorities to support care provision is made possible by the availability and increasing longitudinality of:

- Adult Social Care data;
- Technology Enabled Care data (eg technology solutions that support independence in the home)
- Secondary Uses Service (SUS+) data - NHS England data warehouse that holds pseudonymised hospital activity data for secondary care.

AI by Design

Predicting Risk/Demand:City of Wolverhampton Council

"NHS Social Care Digital Programme – Joined-up demand analysis for health and care"

Uses predictive models on **health + social care data** to understand:

- Who is likely to be admitted/re-admitted.
- What kinds of care pathways and volumes are emerging in future.

That then feeds commissioning decisions about:

- Community support and reablement,
- Intermediate care,
- Residential and nursing placements,
- And, by extension, demand for supported living / extra-care / sheltered housing.

https://www.wolverhampton.gov.uk/news/council-receives-funding-extend-pioneering-ai-project

Predicting Risk/Demand:Worcestershire County Council

worcestershire county council

"Worcestershire predictive analytics under NHS Digital Social Care Pathfinders"

Worcestershire's pathfinder uses AI (supervised classification models) on:

- Telecare/assistive-technology data,
- Adult social care records,
- Health data (SUS), to model patterns of demand and risk.

The explicit policy framing is:

- Use that modelling to decide how much to invest in TEC and community support,
- With the goal of postponing or avoiding long-term residential care, i.e. keeping people in their own home or lower-intensity supported settings longer.

https://digital.nhs.uk/services/social-care-programme/digital-social-care-pathfinders-programme-2019-21/worcestershire-county-council

AI by Design

Summary of Some Other UK Local Authority AI Predictive Modelling

Local Authority	Project	Aim
London Borough of Bexley	Remote monitoring & predictive analytics	Uses remote monitoring and AI to flag residents at risk of deterioration, helping prevent escalation and guide support planning.
St Helens Borough Council	AI-enabled Technology Enabled Care Hub	Smart sensors and analytics predict risks after discharge and support "home-first" care planning.
Norfolk County Council	AI Falls-Risk Identification	Uses NLP on case notes to identify people most at risk of falling so the council can intervene earlier.

AI by Design

Where AI *could* be being increasingly deployed

AI by Design

Problems with Classification Models

Classification modelling is useful to inform human decision making but it can be prone to:

- Overgeneralisation
- Human bias (rigorous rules must be applied to labelling conventions)
- Ignoring latent or unseen dimensions in data sets
- Representation problems

AI by Design

# Potential for Unsupervised Learning Techniques

There is great potential for unsupervised learning aspects of AI to unearth more intelligence about person-centred aspirations for care and independence in later life, and use these to inform design for housing and social care.

Datasets that reflect human aspiration eg:
- Housing LIN / Ipsos *Older People's Housing Preferences*
- ELSA: English Longitudinal Study of Ageing
- Adult Social Care Survey (ASCS)
- Older People's Housing Taskforce

AI by Design

Real World Innovation Example - ELSA Dataset
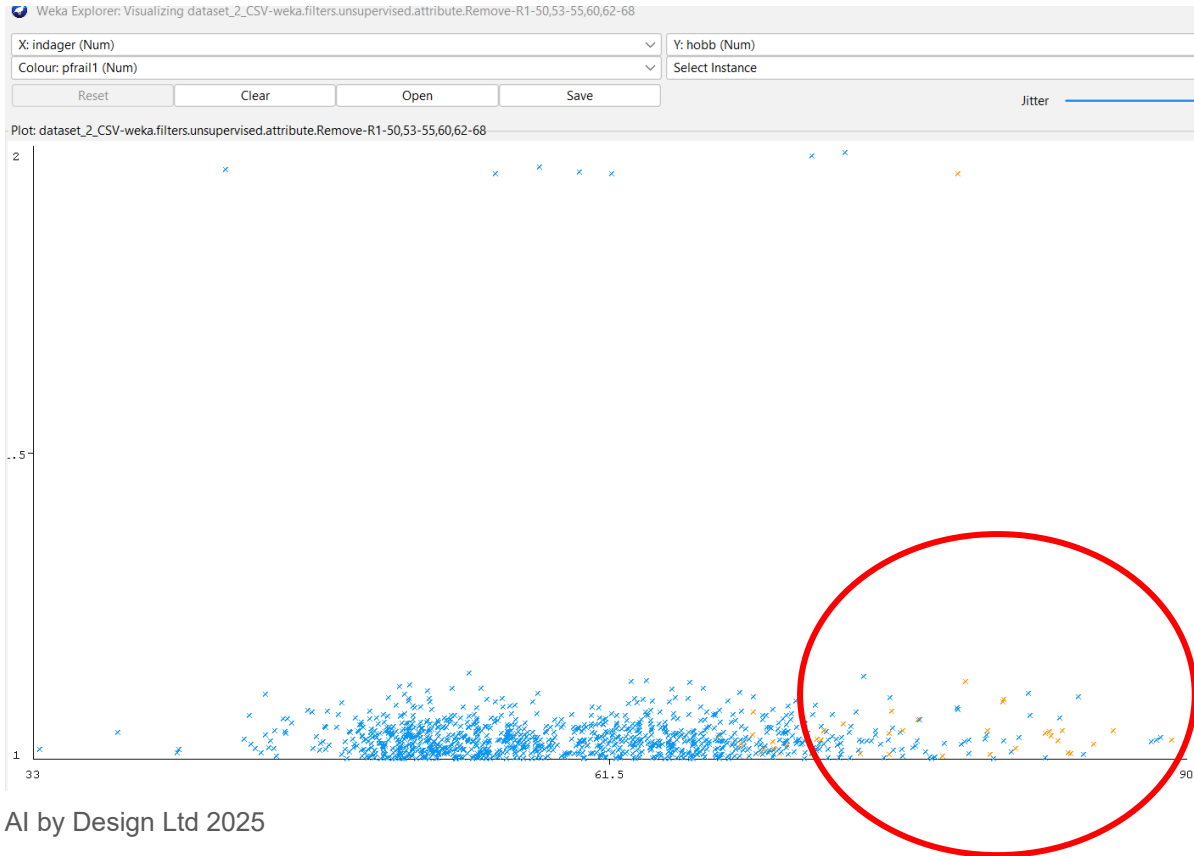
This clustering exercise was performed on a 9,000 row ELSA data set in 2022.

The clustering revealed that groups of people classified as frail by a supervised learning algorithm, were active members of social clubs online, with significant digital agency

AI by Design

Conclusions: Using AI for Predictive Modelling - Care in Later Life

Conclusions:

- In context of predictive modelling, AI can provide significant opportunity to better understand risk and demand in terms of providing care and support options in later life.

- To ensure that models are accurate and representative, it is always advised to deploy multiple techniques (model overlay) to ensure that AI derived logic reflects real human use case, aspiration, need and desire.

AI by Design

Questions & Keeping in Touch

julia@aibydesign.ai
www.linkedin.com/in/julia-glenn-mba-mscai

AI by Design