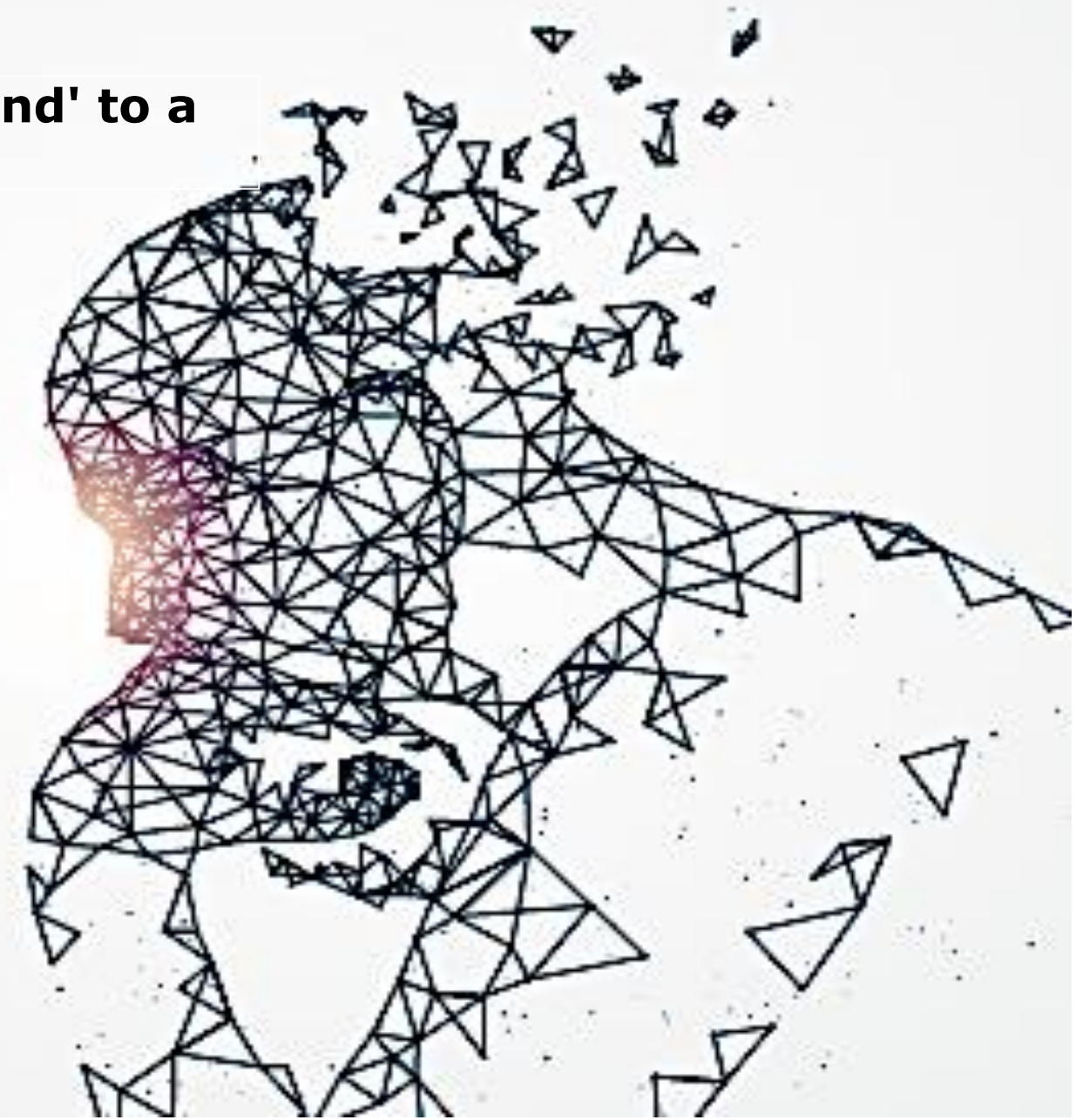
Can an algorithmic system be a 'friend' to a police officer's discretion?

ACM FAT* 2020 Translation Tutorial



Hampshire Constabulary

Northumbria University NEWCASTLE

Law School

Aim

To increase understanding of the importance of discretion in police decision-making and to guide computer scientists in building algorithms that can be friends to that discretion

Objectives

By the end of the tutorial, the audience will have explored

1. The legal concept of discretion in police decision-making in the context of English common law, and potential legal challenges which could arise
2. The realities and contexts in which police discretionary decisions are made, by reference to an MLA currently in development within a domestic violence context, and the views of victims, offenders and police officers;
3. Algorithmic design decisions/features which may help or hinder the legitimate exercise of police discretion
4. Implications for the choice of data inputs, explanation output, the means by which it was obtained, user interface design and the interaction of the algorithmic system with other non-codified relevant information.
5.

Roadmap

1. What do we mean by discretion
2. Domestic abuse (DA) operational context and machine learning algorithmic forecasting tool
3. Implementation considerations – User perspectives
4. English Administrative Law and an algorithmically assisted future
5. DA case study scenario and discussion
6. Summing up

What do we mean by ‘discretion’?

≠

What do we mean by ‘discretion’?

Power or duty of a public sector official, such as a police officer, to **make decisions** based on their **own opinion** subject to **legal boundaries**

Why can’t they just follow the ‘rules’?

It’s not as simple as that…….

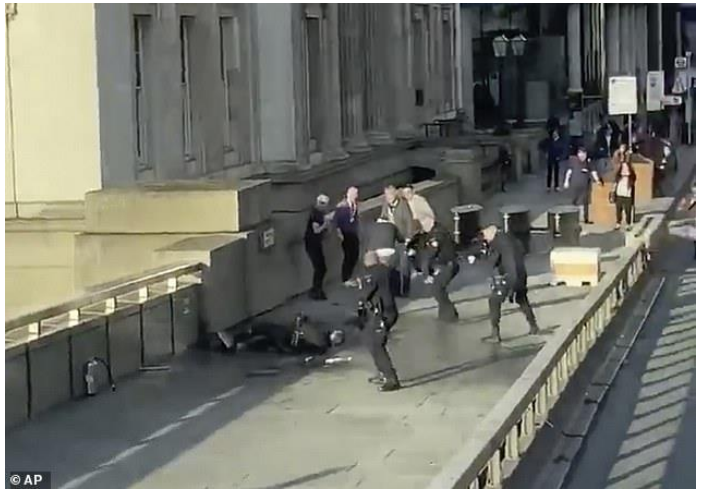
1. Rules cannot cover every scenario; discretion ‘recognizes the **fallibility of interfacing rules with their field of application**’ (Hildebrandt, 2016).

2. The law often requires the officer to make a judgement in a particular **context** based on concepts such as ‘**reasonableness**’ or ‘**risk**’.

3. Discretion permitted to allow for consideration of **merits** of each case **rules not applied unbendingly**; ‘discretion leads to accountability; the exerciser of the discretion can be held responsible ..’ (Babuta, Oswald & Rinik, 2018).

4. The police have to use their discretion as regards **prioritisation and deployment** of resources, and in respect of what fulfilling the policing role might require at any given time.

It’s not as simple as that…….



News

Domestic violence murders at five-year high, amid warning of 'hidden victims of knife crime'

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Domestic violence murders at five year high, amid warning of 'hidden victims of knife crime' CREDIT: DOMINIC LIPINSKI/PA

“Police decision making is often **complex**. Decisions are required in **difficult circumstances** and are often made based on **incomplete or contradictory** information. In addition, police officers and police staff are sometimes required to make decisions in circumstances where those involved deliberately **mislead** or try to mislead them. It is, therefore, not surprising that sometimes the decision does not achieve the best outcome.” (College of Policing APP)

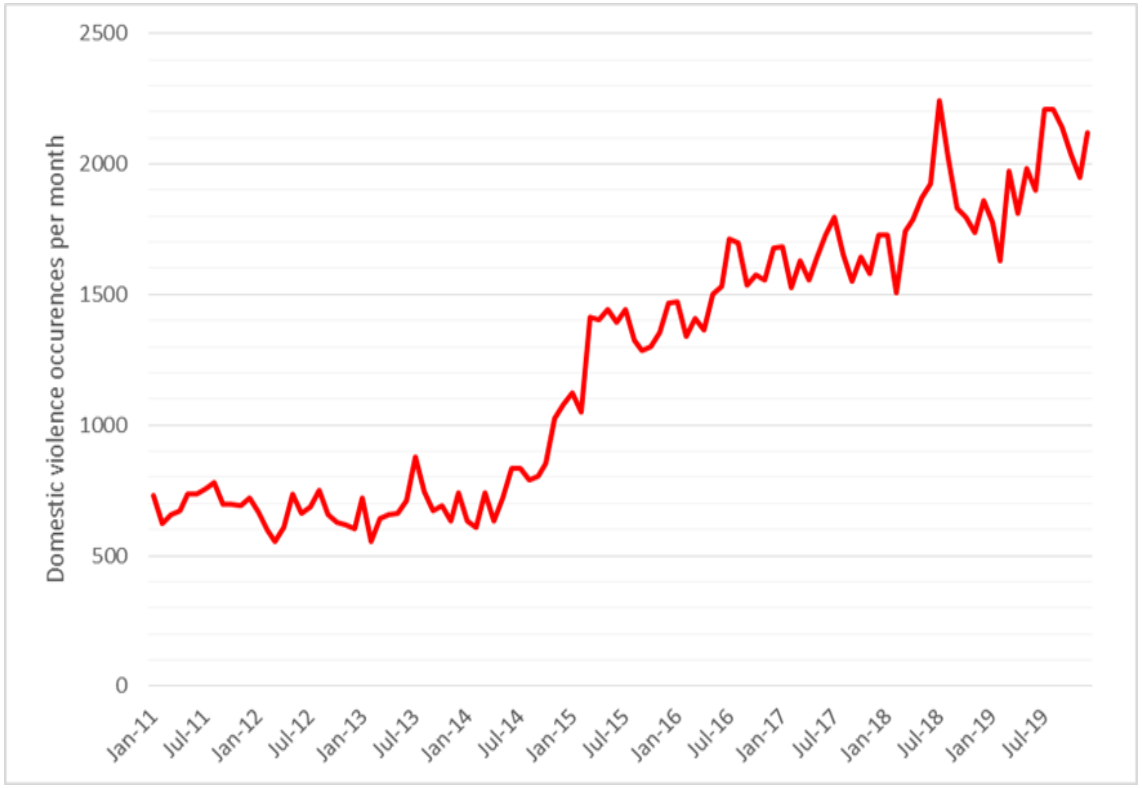
Met police ‘overwhelmed’ by surge in online child sexual abuse

Use of social media to share indecent images is a challenge for police, watchdog finds

▲ The Met said the scale of child abuse and sexual exploitation offending online has grown in recent years. Photograph: Alamy

Domestic Abuse (DA) Operating Context In Numbers

Hampshire DA crimes per month (2011 – 2019)



Current Landscape

- UK 2018 – Costs associated with DA victimisation £66 bn
- UK 2017 – 2 million adults experience DA
- Hants 2014/19 – 70% increase in all crime
- Hants 2014/19 - 200% increase in DA crime
- Hants 2019 – 2200 DA crimes per month
- Hants 2019 – 20% DA High Risk victims

Risk based triage

Domestic Abuse Stalking and Harassment (DASH) Risk Assessment 2009

- Risk assesses likelihood of serious harm
- 27 yes / no questions. Space for additional narrative
- 13 indicators of serious harm in domestic abuse
- Scoring matrix plus officer judgement guides classification and response

Serious harm: A life threatening and/or traumatic event from which recovery, whether physical or psychological, can be expected to be difficult or impossible.

DASH Risk Indicators

High Risk Indicators

- 1 of 1,2,6,8,10,13
- 15 or more positive answers
- 6 or more incidents in last 3 months
- 2 or more of indicators 3,4,5,7,9

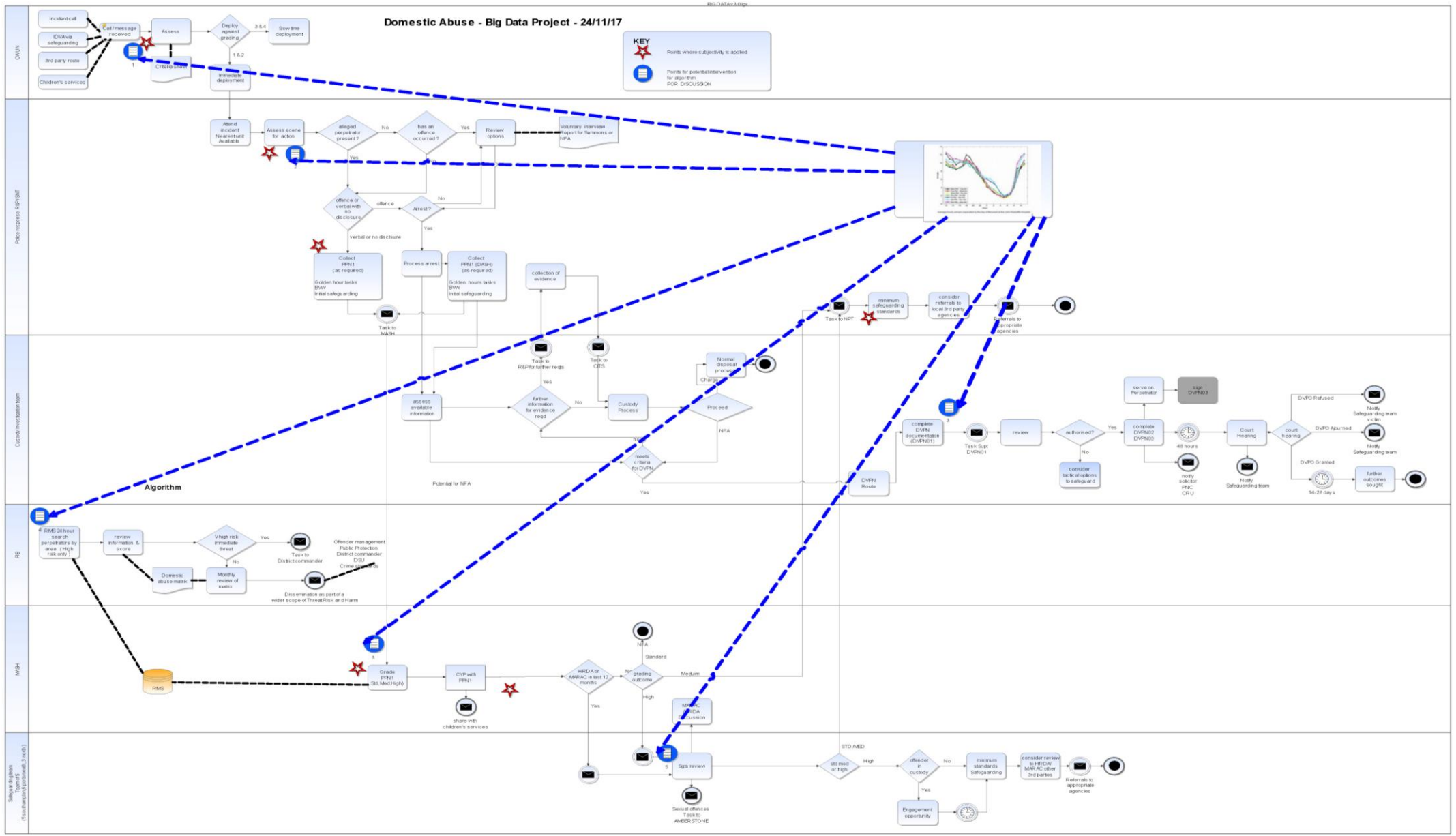
Medium Risk Indicators

- 10 or more positive answers
- 4 or more incidents in last 3 months
- 1 or more of indicators 3,4,5,7,9

Standard Risk Indicators

- No indicators are present

Multiple deployment and decision points



DASH analysis……. The current risk assessment processes in domestic abuse identifies a need to provide greater support for DA professionals in identifying risk posed to victims from perpetrators

- ✗ high false positive rate at high risk 92 – 99%, high general false positive rate, 20% false negative rate
- ✗ Risk assess serious harm only rather than reoffending. High reoffending rates post initial assessment
- ✗ Risk assesses perpetrator through victims lens
- ✗ Completion influenced by a range of qualitative factors (e.g. victim's emotional state, officer attitude, competing demands
- ✗ sub optimal predictor of DA revictimisation

- ✓ Voice of the Victim - Rich data collection of victim experience
- ✓ Risk assesses perpetrator through victims lens
- ✓ Risk framework and assessment criteria shared by all DA professional creates common language
- ✓ identifies factors that are associated with domestic abuse

How can a machine learning algorithm provide support to police forces in improving perpetrator based domestic abuse risk

MLA Domestic Abuse Risk Forecasting Tool

✓ … Use **MLA approach** to risk assessment to **improve the police service to victims** through more accurate assessment of risk

✓ … **Re-balance risk in the system** from risk assessment based on DASH field assessment to understanding the propensity of perpetrator re-offending

✓ … **Predict** the **risk of domestic abuse re-offending**, focusing on offender track record (next 2 years), with a new risk classification

MLA Domestic Abuse Risk Forecasting Tool

✗ … **Not** DASH **replacement** but **supplementary**

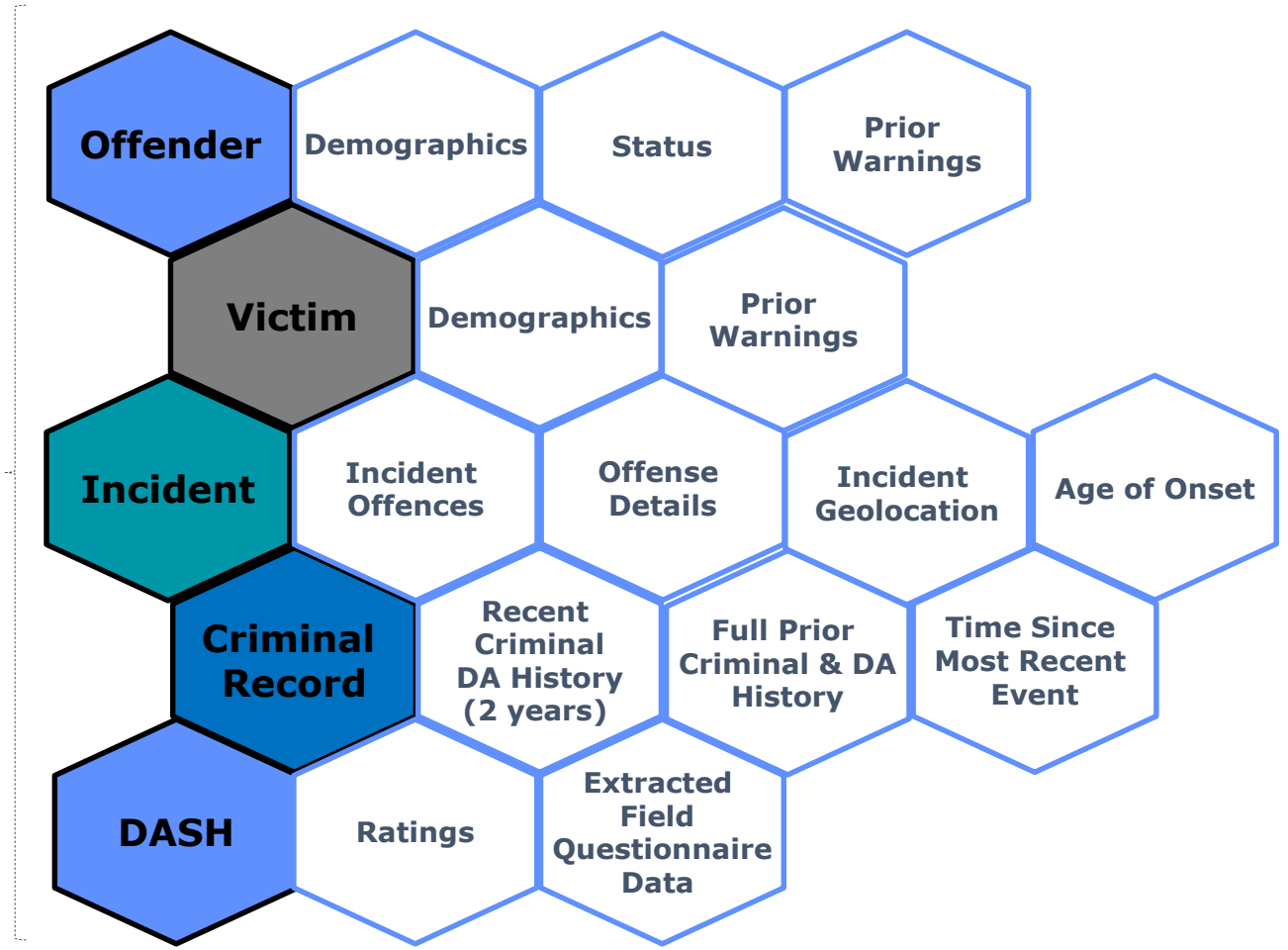
✗ … **Not** a **replacement** for human decision making but **supplementary**

✗ … **Not** a prediction for current DASH field risk classification

Machine Learning Algorithm Domestic Abuse Forecasting tool

The AI forecasting model learns to classify the risk of DA re-offending, from multiple data points – offender, victim, incident, criminal record and DASH risk assessment

AI Model Predictors



High Risk DA Perpetrator

- Will commit a serious DA related offence within two years
- e.G GBH, Rape, Homicide, Arson

Medium Risk DA perpetrator

- Will commit 2 or more non serious DA related offences within two years
- e.g ABH, common assault

Low risk DA perpetrator

- No new offending in 2 years

Using an MLA methodology to compare accuracy rates against the DASH assessment tool

Analysis Breakdown	DASH Analysis (Practical baseline)	AI Modelling
	2014 - 2017 dataset	2011 - 2017 dataset
	35, 554 DA occurrences with named suspects	62,631 DA occurrences with named suspects
	✓ DASH risk assessment attached to occurrence	✓ DASH questionnaire data (~60) – 28 structured questions + risk assessment
	Risk assessed as High, medium, low	
	Suspects offending tracked over following two years to identify reoffending	
	Efficacy of DASH data as predictor of reoffending	

The MLA risk forecasting model achieves incremental benefits at every level against the current baseline, with great flexibility for further fine-tuning and learning

Current DASH RISK Assessment

- Overall accuracy levels are low
- High amount of false positives at high and medium risk
- False positive errors are high
- False negative errors 1 in 5 cases
- High risk classification ~25% but the false positive rate at high risk is ~92%

AI Risk Forecasting Model

- Improved accuracy of predictions ~24%
- Reduced false positives ~60%
- Reduced the same rate of false negatives
- ~25% greater accuracy of predicting low risk
- Decreased ~20% false positive high risk
- Understanding of significant features in predicting risk outcomes

Considerations

The MLA approach has the flexibility to fine tune a series of models that apply different degrees of focus on balancing demand in the system whilst ensuring a safe risk assessment model

MLA Implementation ……. Ethnographic research to understand challenges of implementation from domestic abuse community – users and subjects

domestic abuse is a human condition with human responses and algorithms by their very nature are not responding in a human way

I see this as a very supportive friend to discretion

my algorithm says this should happen but actually I'm gonna do this cause it'll give the best outcome

that gut feeling of the officer, because you are the person there with experience…

Where is the victim in all of this…

our professional judgement is being taken out of the equation

how open and transparent that is to the perpetrator because we are very open about our assessments

Understanding what data was used in the algorithm helps build confidence

important to be transparent to the public and for us to understand what we're working with

What legal status does this have? What do CPS think?"

The, I think no one will challenge what the computer says, no one will ever go against what the computer says

It's a problem if you don't have DASH data……

what is a current and what's a static risk factor and what are the factors that are dynamic? You know, it's a minefield

from a victim's point of view there is no way that telling them "we have calculated and on this balance of probability you are not going to get assaulted again" is going to work

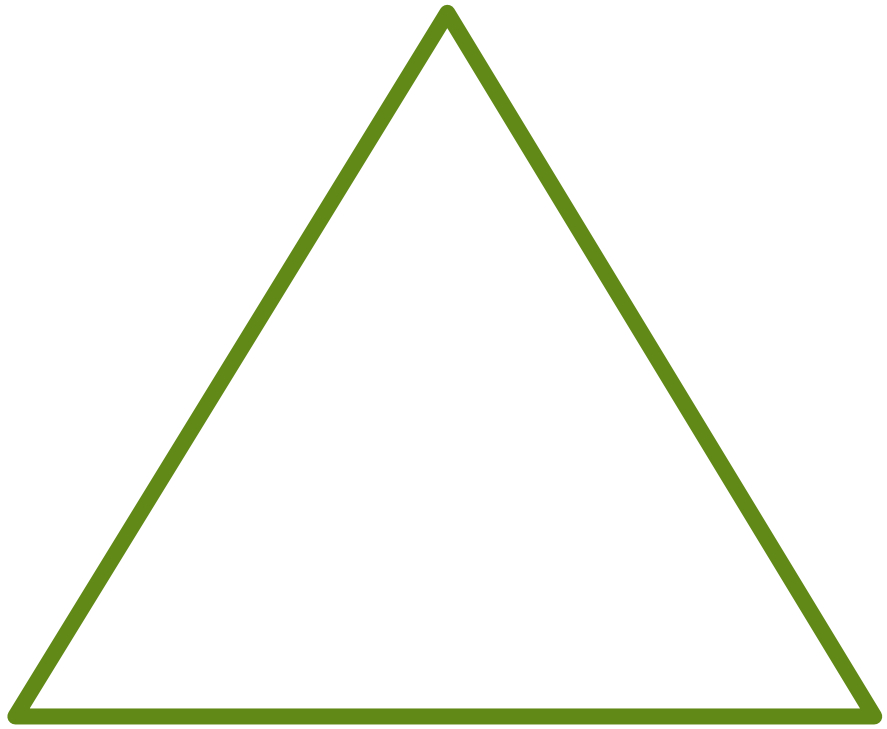
But police data has real quality issues…….. Rubbish in, rubbish out

we might be basing some decisions on information that is hidden from that person actually you know I would argue that's a bit unhelpful

where professional judgement and an algorithm point in different directions there has to be a process for taking a fresh look

Looking back to ‘old’ law to guide an algorithmically assisted future

Natural justice & the duty to give reasons



Fettering discretion

Irrelevant & relevant considerations

Is the output of an algorithm a 'relevant' consideration?

We need to know how the algorithm's '**mind is working**' in order to judge (Lord Mustill in *Doody* [1994])

"90% 'accurate' so that's alright then?"

"But what does that % hide?"

"if other things equal, shoe size is a useful predictor of recidivism, then it can be included as a predictor. Why shoe size matters is immaterial."

Richard A. Berk & Justin Bleich 'Statistical Procedures for Forecasting Criminal Behavior' (2013) Criminology & Public Policy 12(3)

Or

“The problem comes when the database and the engine go from coach to oracle”

(Garry Kasparov, 2017)

And

‘it is difficult for the decision-maker to disregard the number and alter their evaluation even if presented with detailed, credible and contradictory information’

(Cooke and Michie, 2012)

"But the **valid** exercise of a discretion always requires a **genuine application** of the mind and a **conscious choice** by the **correct authority**."

Wade & Forsyth, Administrative Law, 10th edition (Oxford)

Discretion and the challenge for algorithms

1. Police are operating in conditions of **uncertainty.** Algorithms have the **potential** to;

2. package relevant factors in a way that could facilitate more efficient decision-making (Babuta, Oswald and Rinik, 2018), contributing to the identification of the factors most relevant to the decision at hand

3. contribute relevant analysis into a decision-making process

4. Machine learning systems are **consistently subjective**

5. ……..but not facilitating consideration of the particulars of the case at hand. In some cases this will constitute a prima facie case of fettering discretion. Given this, machine learning systems may be inappropriate for decisions where discretionary powers are likely to need to be exercised on a case-by-case basis, or in other situations where policy may generally be applied but where exceptions are likely to need to be permitted.' (Cobbe, 2019)

Discretion and the challenge for algorithms

1. Risk of fettering discretion if **only take certain factors into account** e.g. those that may indicate risk (but on what basis?) or those which can be easily codified into a tool

2. **Un-nuanced** scores packaged as indicating 'risk' or need, or objective assessment. **Risk is the human judgement**

3. Binary nature eliminating any power to deal with **'hard' cases** (Bayamlıoğlu and Leenes, 2018)

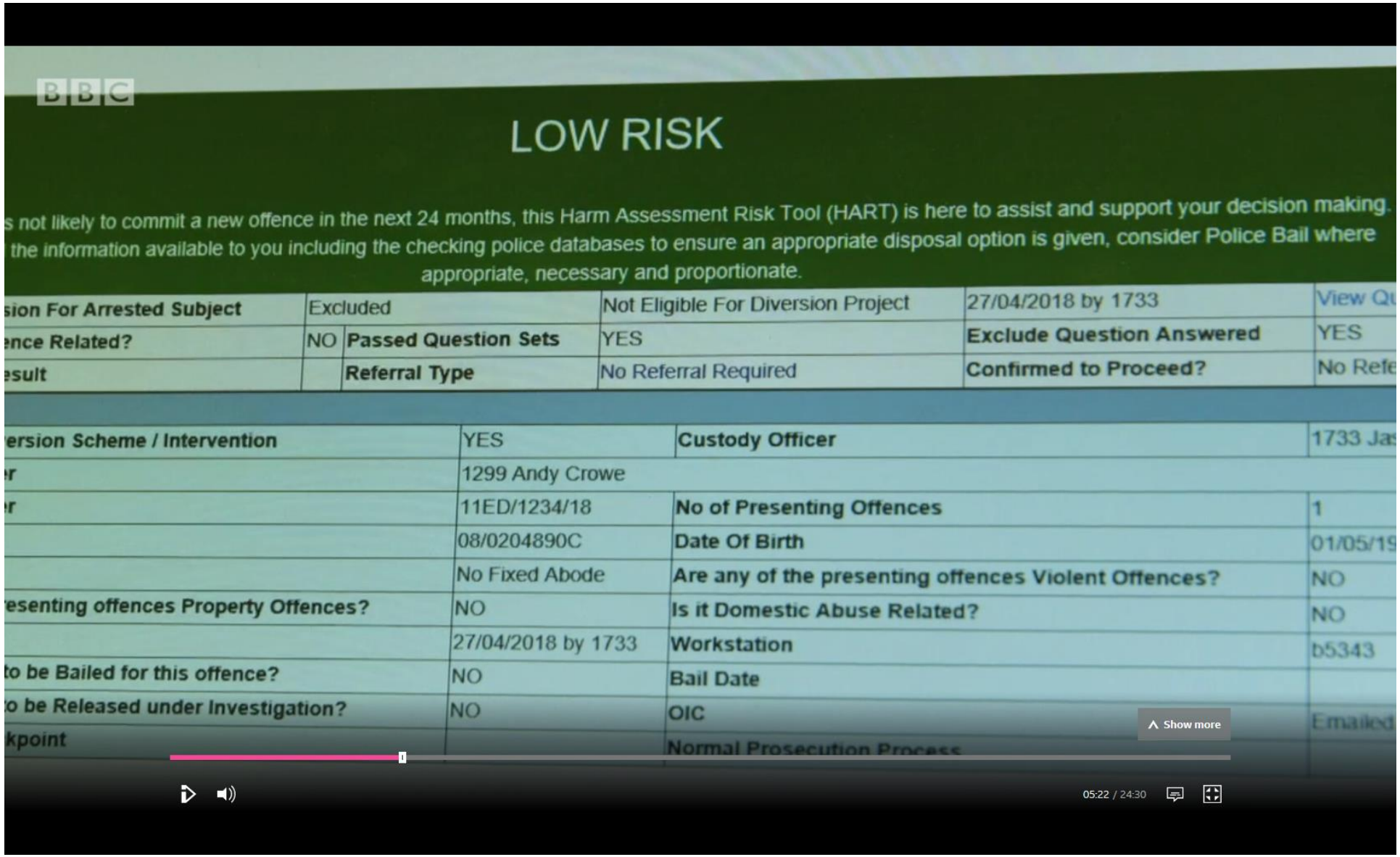
4. Too much importance being attached to the tool, resulting in nervousness about the 'defenceability' of **taking action contrary** to the algorithmic recommendation (Avon and Somerset inspector quoted in Dencik et al., 2018).

Discretion and the challenge for algorithms

"Questions and decisions based on **risk**, and **legal concepts** such as 'reasonableness', 'public interest' and opinions of necessity represent a challenge for algorithms…to produce a model that is genuinely able to reflect the **complexity of individual circumstances**, which apply to the **multiple elements** that may need to be considered, and which produce **every choice** of next steps that could reasonably apply to the decision(s) in question." (Oswald, 2018)

"**Design** affects our expectations about how things work and the context within which we are acting."

(Privacy's Blueprint: The Battle to Control the Design of New Technologies by Woodrow Hartzog, Harvard University Press 2018)


BBC
LOW RISK
s not likely to commit a new offence in the next 24 months, this Harm Assessment Risk Tool (HART) is here to assist and support your decision making.
the information available to you including the checking police databases to ensure an appropriate disposal option is given, consider Police Bail where appropriate, necessary and proportionate.
sion For Arrested Subject
Excluded
Not Eligible For Diversion Project
27/04/2018 by 1733
View Qu
ence Related?
NO
Passed Question Sets
YES
Exclude Question Answered
YES
esult
Referral Type
No Referral Required
Confirmed to Proceed?
No Refe
ersion Scheme / Intervention
YES
Custody Officer
1733 Jas
r
1299 Andy Crowe
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No of Presenting Offences
1
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Date Of Birth
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No Fixed Abode
Are any of the presenting offences Violent Offences?
NO
esenting offences Property Offences?
NO
Is it Domestic Abuse Related?
NO
27/04/2018 by 1733
Workstation
b5343
to be Bailed for this offence?
NO
Bail Date
o be Released under Investigation?
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Being a friend to discretion

"The decision-making process, of which the algorithmic tool is part, must preserve the human discretion to assess '**un-thought of' relevant factors**, and to assess whether the **question** or decision is the one for which the algorithm was designed. Algorithms should not be inserted into a process that requires the exercise of discretion by a public authority **where the algorithm prevents that discretion**; either because all of the factors relevant to the decision cannot be included, or required elements of the decision itself cannot be appropriately codified into, or by, the algorithm.." (Oswald, 2018)

DA case study scenario and discussion

The following slides represent a realistic scenario in which law enforcement professionals may expect to use an MLA to forecast the risk posed by a domestic abuse perpetrator to inform their decision making

Consider the following questions in scenario 1 focusing on the implementing organization and the police officer decision

1. What should the implementing organization consider in supporting its staff to use an MLA forecasting tool as a friend to their discretion in a DA context?
2. What are the algorithmic design decisions/features which may help or hinder the professional in the legitimate exercise of police discretion?
3. What are the implications for the choice of data inputs, explanation of the output and the means by which it was obtained in supporting the police officer’s decision
4. What are the considerations in user interface design and the interaction of the algorithmic system with other non-codified relevant information in informing the police officers decision

Domestic abuse case study scenario……..

Southampton

- Population 250,000
- x crimes and incidents per day
- DA incidents per day
- 14 police officers on duty
- X deployments waiting

Call for service

- 999 female caller
- assaulted by her partner. Perpetrator present but in separate room
- Police dispatched emergency response

Victim

- No visible injuries.
- discloses verbal only argument.
- No formal allegation. Appears to be drunk
- 1 previous verbal domestic at address in last three months
- DASH indicators - Standard

Perpetrator

- Calm and unflustered
- Verbal argument only
- No pre convictions for DA but check of last 1 year shows arrest for DA assault with prev partner

Police officer

- Tries to engage with victim but no cooperation
- Pressure to redploy
- Suspicious of circs - more info to take further action – **Officer decision?**

MLA

- Available to assist officer with perpetrator assessment
- Output – Medium risk perpetrator will reoffend
- **Officer decision?**

DA case study scenario and discussion part 2

Consider the following questions in scenario slide 2 focusing on the perpetrator, victim and legal processes

1. What are the algorithmic design decisions/features which may help or hinder the professional in explaining the reasons for their decision to the victim, perpetrator and legal professionals.

2. What are the implications for the choice of data inputs, explanation of the output and the means by which it was obtained in explaining the police officer's decision to victim, perpetrator and legal professionals / processes

3. What are the considerations in user interface design and the interaction of the algorithmic system with other non-codified relevant information in explaining the police officer's decision to victim, perpetrator

Domestic abuse case study scenario……. continued

Custody

- Perpetrator arrested
- PACE requires arrest reasons
- How is MLA presented to justify detention – PACE compliance?
- What is perpetrator told?
- What is legal rep told?

Interview

- Perpetrator is interviewed
- Denies assault
- Insufficient evidence to charge – release?

Victim

- Needs more time
- Clares Law – **Could** be used. How is MLA presented to explain perp risk?
- Domestic Violence Protection Notice **could** be applied for (DVPN)
- Officer discretion

DVPN

- Superintendent authority
- Judicial process – Mags Court
- Application depends in part on MLA output
- How presented

Police officer

DVPN authorised

Re-engages with victim witness statement obtained

Further arrest of perp – prosecution to follow

MLA

- Feedback loop
- Input of recent case into police records
- MLA continues to learn