

Dedicated Image Based Vehicle Identification & Classification Subsystems For AET

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Introduction

- AET has presented us with some real operational challenges when it comes to the need for identifying a vehicle from an image
- Customer expectations also place a particularly high burden on getting image based identifications right
 - *An understandable and seamless AET experience*
 - *Confidence the same rules apply to everyone (trust)*

Introduction

- Looking back a bit - IBTTA 2014 AET Summit Thematic report
 - *“.. much of the discussion in San Diego focused on the systems and strategies that would enable even more agencies to convert to all-electronic tolling. With orders of magnitude more license plate images to process, a panellist said agencies were going through “a ton of system changes, tightening the bolts and making sure nothing is slipping through the gaps.”” (weathering the storm)*
- This presentation: a quick look at ‘traditional’ solutions to identification by image and can we do better?

Identification by Image – Technology Limits

- Ideal technology solution
 - *Full automation on all cases*
 - *Perfect accuracy*
 - *No leakage (false rejects)*
 - *Accept any quality image data stream*
 - *Scales without negative impacts*
- Not (yet) technically achievable

Identification by Image – Trade-offs in Real Solutions

- Real world AET systems face a need to make trade-offs
- Directed at the best outcome their business model and technical platform (RS/imaging systems) will allow
- The standard trade-off is to apply some degree of manual effort (image review), in order to balance business targets for accuracy and leakage against total cost... but..
 - *Systems with MIR quickly become more complex*
 - *How to make informed decisions?*

Identification by Image – “Traditional” Approaches

- Broad brush but .. standard approach involves rolling the whole problem into system integrator / integrated BO space
- Technical splits of automation (core ALPR / VSR), then manual review to handle the less confident ‘remainder’
- Upgrading an existing BO for AET can be very tricky
 - *Robustness risks*
 - *Difficulty in addressing operational optimization and tuning*

Identification by Image – How can we do better?

- Think in terms of a Dedicated Image Based Vehicle Identification & Classification Subsystem
 - *Input: Transaction data stream with images*
 - *Output: Fully identified/classified vehicle (LPN) or ‘not-identifiable’*
- A single, easily understood, well defined scope (good building block)
- Both technical and business advantages

Identification by Image – How can we do better?

- Technical advantages
 - *A subsystem with clean integration points*
 - *Addressing a broader problem can exploit a wider range of synergies*
 - *Ability to take a holistic AIP & MIR workflow for fine grained efficiency trade-offs & control design for robustness*
 - *Design can leverage consolidated relevant data for exploiting statistical and pattern analysis for efficiencies*
 - *Provide focused operational insight into all aspects of this critical business process (visibility of trade-offs)*

Identification by Image – How can we do better?

- Business advantages
 - *A single sub supplier can be engaged to provide the needed capabilities*
 - *Clear, business relevant, KPIs/SLAs can be defined & applied*
 - Throughput, turn-around time, identification error rate, false reject rate, data quality
 - *Enables better apples to apples comparisons between vendors*
 - *Potential for opening up vendor competition*
 - *Complete business process outsourcing is fully possible and in fact proven to work well.*

Identification by Image – How can we do better?

- Q-Free have developed an integrated Image Based Vehicle Identification & Classification Platform (EIP) based on this philosophy
- A technical solution addressing a whole process approach to Image based Vehicle identification (AIP & MIR)
 - *Close customer co-operation during implementation and adoption*
 - *Proven to deliver on its potential, including ability to transition*
- Operationally proven at scale, delivering tangible business value

Concluding Remarks

- AET's need for image based vehicle identification not going away soon, and neither is Manual Image Review
- Moving toward a Dedicated Image Based Vehicle Identification Subsystem approach with a holistic focus offers strong technical and business advantages.
- A limited set of clear, business process relevant KPIs can be defined that promote focus on outcomes not details and open for apples-to-apples vendor comparisons
- A real world, operationally proven, approach

Thank you for your attention!

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