

Implementation of FI in preparation for EES EIO

Face Image Quality Workshop - Nov 7, 2023

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Polisen
Swedish Police



EUROPEISKA UNIONEN
Fonden för inre säkerhet



Strategy

- Brand new, modern border control application
- Agile rollout process – soon 90 releases in 24 months
- Hardware & software independent
- Own resources
- Product approach
- Good understanding for the business
- Hardware/functional/UX alignment in preparation for EES

Sweden's approach

- Verify document ownership – "EES compatible"
- Early rollout of new hardware
- High resolution camera - distance
- Mounted in portrait mode
- Support for multiple people in front of camera
- Burst mode – multiple photos per traveler
- USK + own algorithms
- Automatic step or on request
- High quality capture – dual use

Our "product"

Misc

- The border control system guides the border guard depending on type of traveler
- Only relevant information is presented – avoid information overload
- Digital first – border guard assist the system when necessary
- Parallelization of algorithms – queue
 - Steps for same category of traveler can come in different order
- Data/information populated "on the fly" when ready
 - As a new step
 - Populate information in an existing page
- Prepared for new functionality
- Metrics

Optimisation/parallelization (example)

Traditional approach

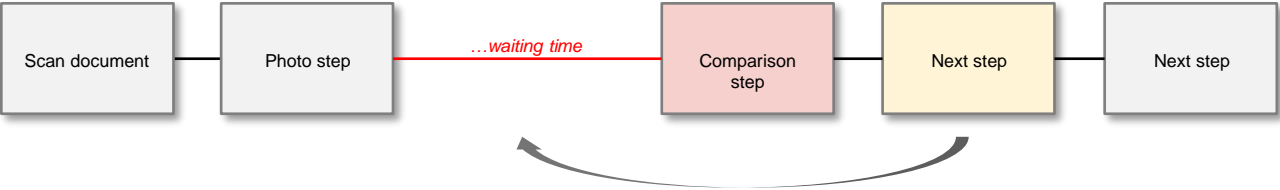


Start
Border
Control

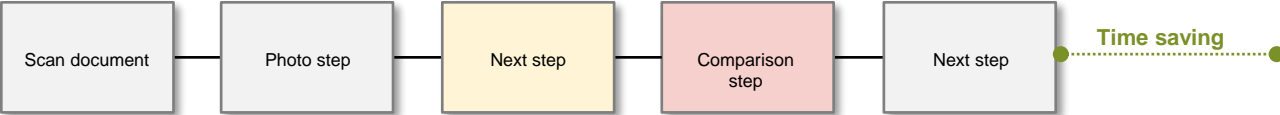
End
Border
Control

Optimisation/parallelization (switch order)

Traditional approach



New approach

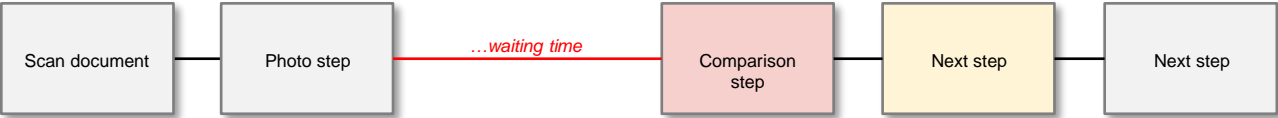


Start
Border
Control

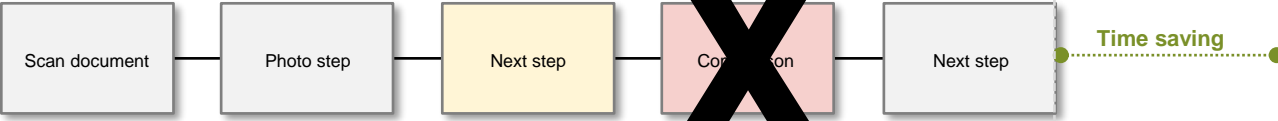
End
Border
Control

Optimisation/parallelization (remove step)

Traditional approach



New approach

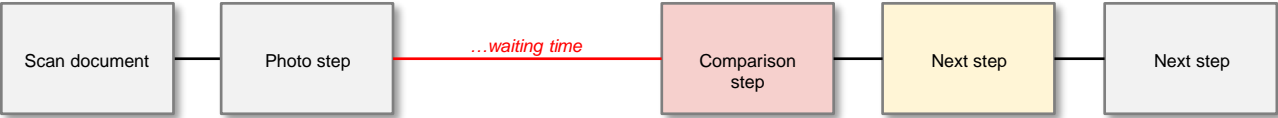


Start
Border
Control

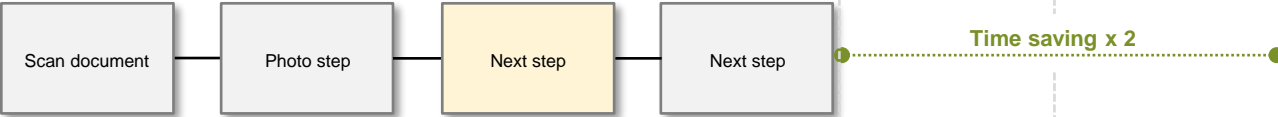
End
Border
Control

Optimisation/parallelization (example)

Traditional approach



New approach

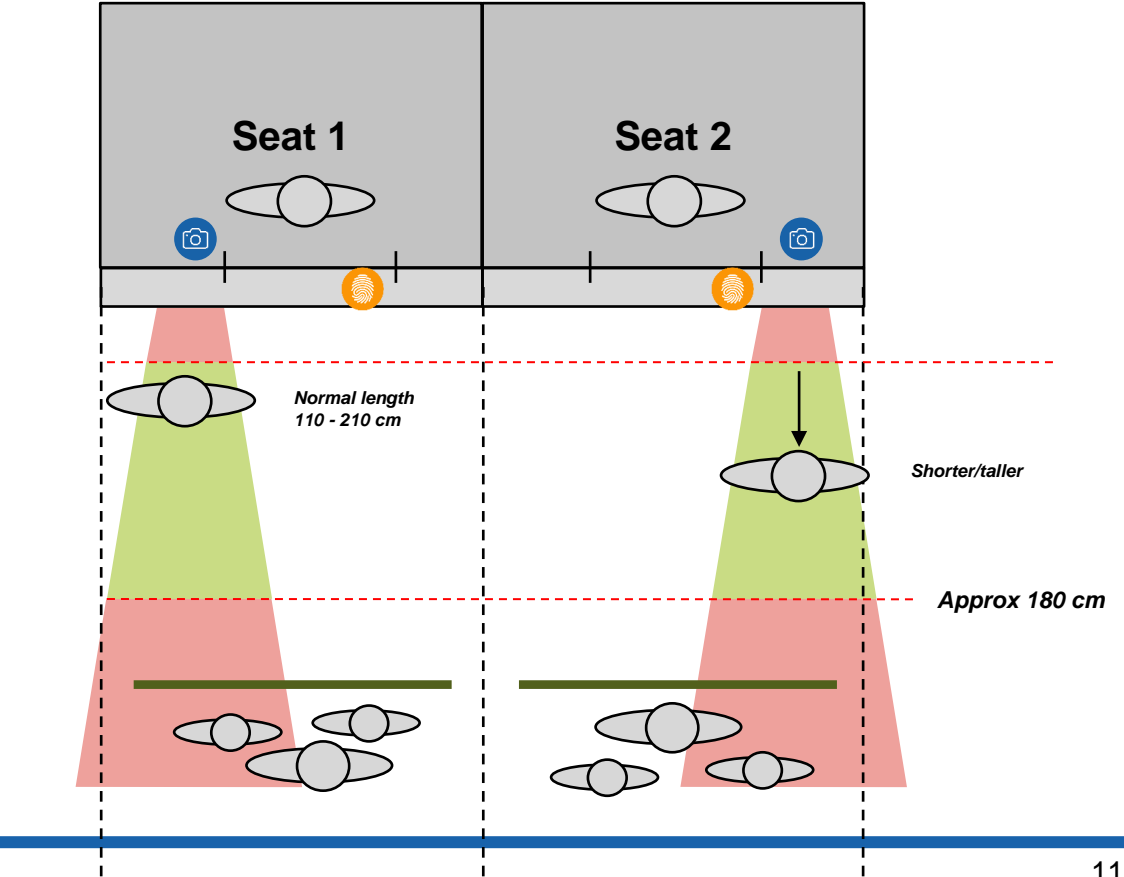


Start
Border
Control

End
Border
Control

The solution

Photographable area



Border guard's perspective

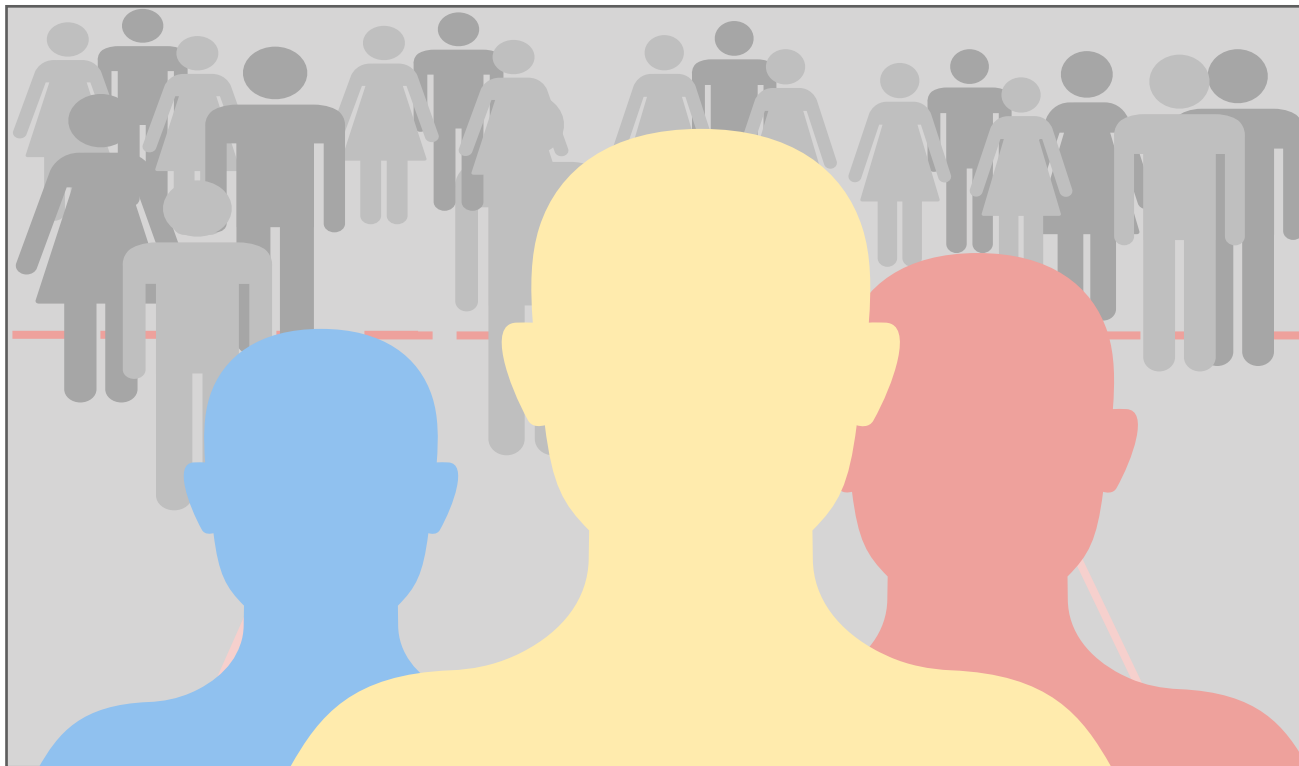
The screenshot shows a web browser window with the URL <https://granskontroll.ltu.polisen.se/#/personkontroll>. The page title is "Arvidsjaur flygplats" and the user is logged in as "Daniel Segu". The main content area is titled "Upppta foto" and displays a live video feed of two men. A red rectangular frame is drawn around the man in the background, and a green rectangular frame is drawn around the man in the foreground. A camera icon is visible at the bottom center of the video feed. To the left of the video feed, there is a sidebar with a profile picture and a "Pass" section containing fields for "Efternamn", "Födelsedatum", "Nationalitet", and "USA". Below the "Pass" section, there are sections for "Inresegrund" and "Efterlysningar". At the bottom of the page, there are navigation links for "Wifma", "BIL", "BES", "BITA", "PMF", "SökES", and "ASP".

Red frame – face is identified but too far away from camera. Face will be ignored

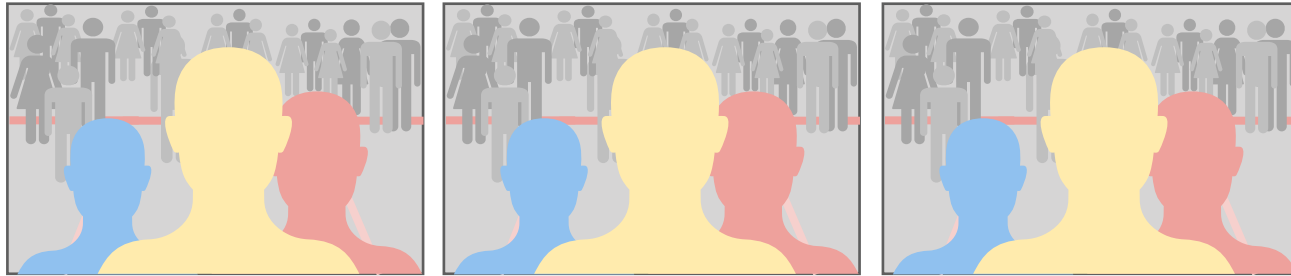
Green frame – face is identified and in range. Face will be captured.

Click the camera button or push enter to capture photos

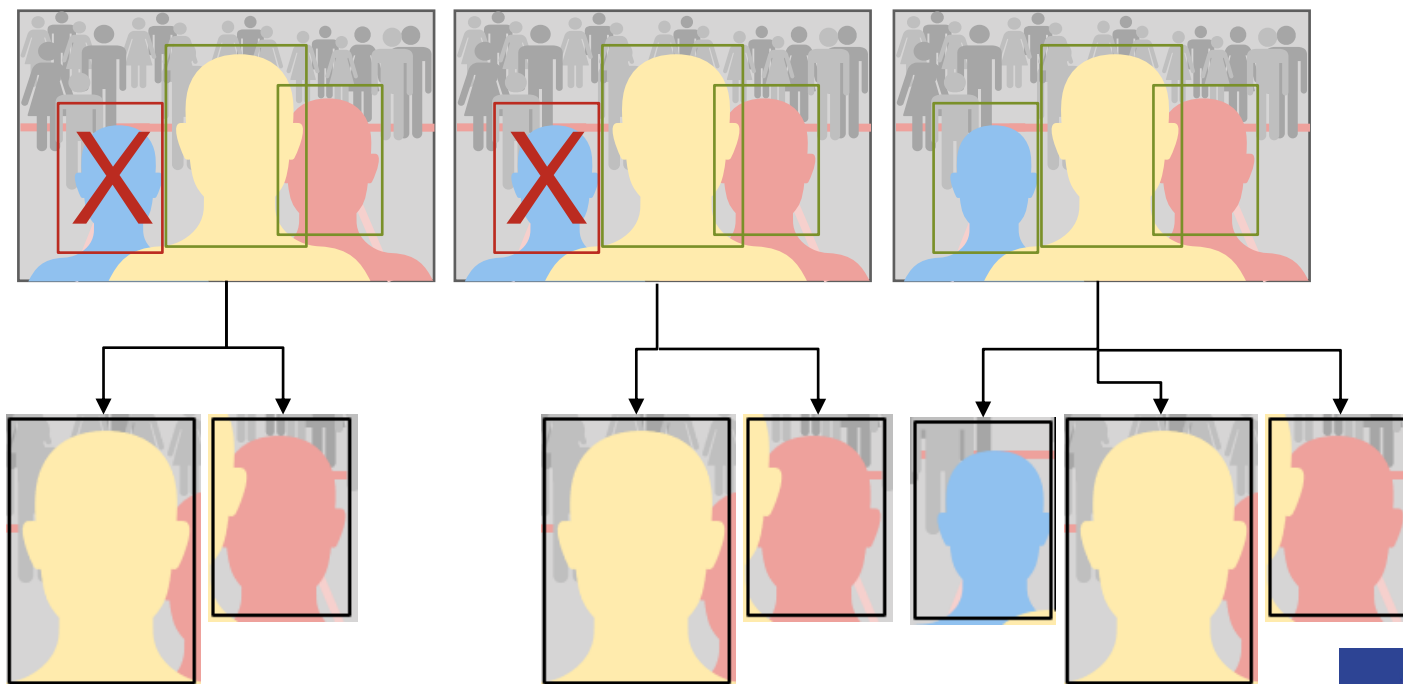
Camera's perspective



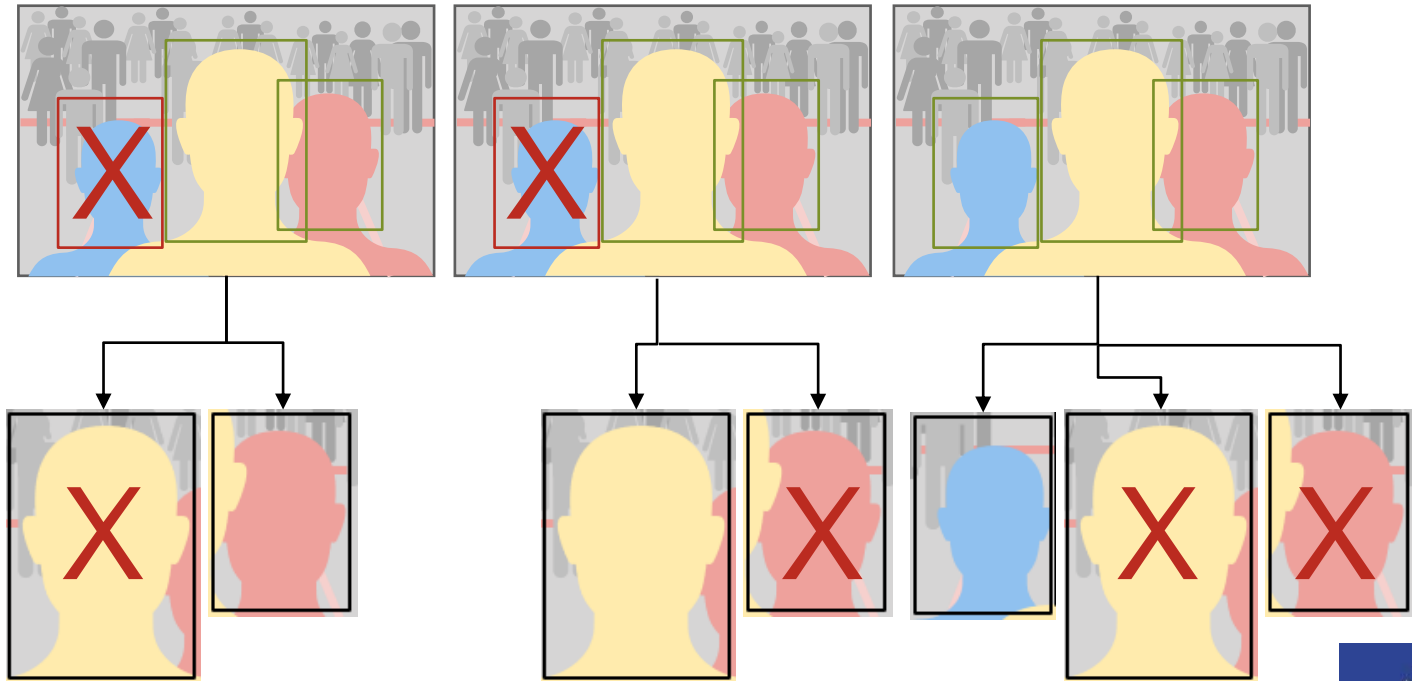
3-4 photos are captured



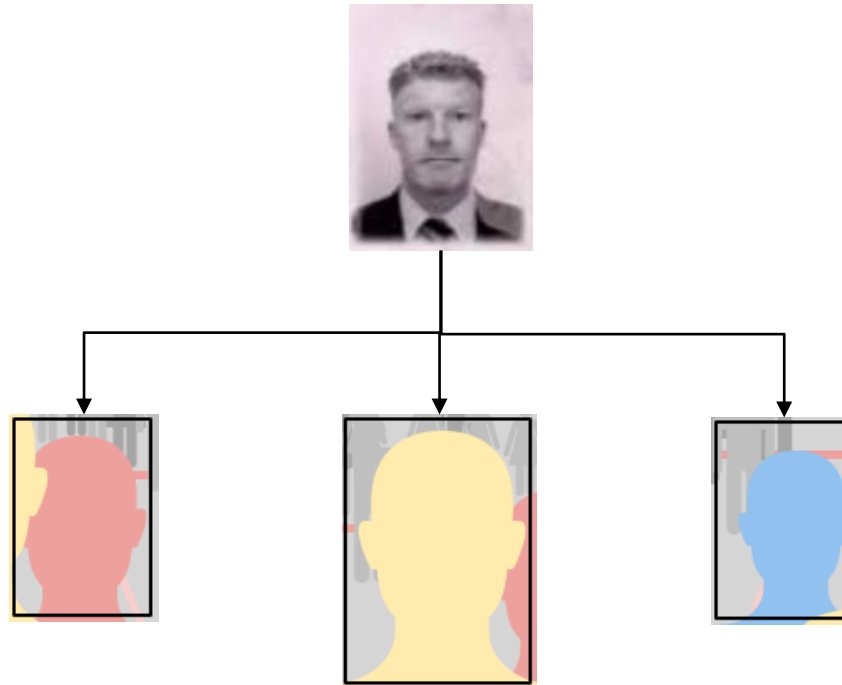
Cut out faces from all photos



USK + open eye analysis



Compare chip photo with EES ready faces



Handling the result



Best result of the biometric comparisons decides what happens next:

- If best score is above threshold – just continue
- If best score is below threshold – show comparison step



Manual comparison – below threshold

The screenshot shows a web application for border control. On the left, a sidebar displays the details of a person: **Pass** information for Jodie Pippa, born 1985-01-17, from the United Kingdom. A warning message states: "Handlingen utgånngen 2016-01-31". The main area is titled "Jämför bilder" (Compare photos) and shows two photos side-by-side: "Upptaget pass" (Scanned passport photo) and "Upptaget foto" (Scanned photo). A "Zooma" button is positioned above the photos. Below the photos are buttons for "Ta om fotosegget" (Retake photo) and "Fortsätt" (Continue). A "Quick zoom feature" callout points to the "Zooma" button. A "Continue if okay" callout points to the "Fortsätt" button. A "Retake photo if needed" callout points to the "Ta om fotosegget" button.

Feedback - recapture

The screenshots illustrate a recapture process in a web application. The interface is titled 'Gränskontroll' and 'Stockholm bromma flygplats'. It features a user profile on the left with the following details:

Pass	Uppgå foto
Personnummer: 1987-01-09 (56 år)	1987-01-09 (56 år)
Sex: Man	Sex: Man
Utbildning: Sydamerika	Utbildning: Sydamerika

The main area shows a video feed of a woman with blonde hair. A warning message is displayed: 'De reseraren ska inte sitta på gästgöran...'. Below the video feed is a 'Uppgå foto' button. The interface also includes a 'Förklarad' button and a 'Förklarad' button.

Zoom in anywhere

The screenshot shows a web browser window displaying a border control interface. The browser address bar shows the URL <https://granskontroll.utv.polisen.se/#/personkontroll>. The page title is "Gränskontroll" and the location is "Stockholm bromma flygplats". The user is identified as "Daniel Segul".

The main content area is titled "Jämför bilder" (Compare images). It displays two side-by-side images of a man's face: "Skannad bild pass" (Scanned passport photo) on the left and "Uppskattnings foto" (Estimated photo) on the right. A yellow callout box labeled "Lens size" points to the "större lins" (larger lens) button above the images. Another yellow callout box labeled "Individual zoom and placement of lens" points to the zoomed-in areas of both images, which are shown with black rectangular boxes.

On the left side of the interface, there is a profile card for "Daniel Segul" with the following details:

- Pass: [Detaljer](#)
- Efternamn: Segul
- Förnamn: Daniel
- Ålder: 56 år
- Sex: Man
- Födelsedatum: 1967-01-09 (56 år)
- Nationellt: Sydafrika
- Utländsk: Sydafrika

Below the profile card, there is a section for "Inresegrund" (Reason for entry) and "Efterlysningar" (Wanted notices).

At the bottom of the interface, there are buttons for "Ta en fotoserier" (Take a photo series), "Forsätt" (Continue), "Avbryt" (Cancel), and "Utred vidare" (Investigate further).

Manual check always available

The screenshot displays the 'Gränskontroll' (Border Control) interface for a traveler named Daniel Segul. The page is titled 'Ta beslut utifrån sammanställning' (Make a decision based on the summary). The interface includes a sidebar with the traveler's photo, passport details, and entry status. The main content area shows a decision summary with two sections: 'Inresegrund' (Reason for entry) and 'Innehavarkontroll' (Retention control). The 'Innehavarkontroll' section indicates that no significant similarities were found in the digital facial comparison. A yellow callout box points to the 'Innehavarkontroll' section, stating: 'Summary page – always possible to go back and verify again'. The interface also includes buttons for 'Uppåtta fingrar (SIS)' and 'Inpassera', and a footer with navigation links like 'Wilmix', 'FIL', 'RES', 'DITA', 'PMF', 'SIS/ES', and 'ASP'.

Results from initial tests

- It takes approximately 8 seconds from start scanning the passport until the photo step is initiated.
- Max time for instruction and release of camera step: 36 seconds
- Min time for instruction and release of camera step : 8 seconds (traveler imitated behavior)

- *Average for instruction and camera: 18 seconds

**Including comparison step for 20% of the travelers*

Thank you for you attention!

Contact

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