Novetta's Biosynthetics software creates large-scale fingerprint, face, and iris image datasets suitable for performance testing.

**FINGERPRINT**
The Biosynthetics software creates realistic-appearing, flat fingerprints, emulating impressions from FBI-certified optical scanners. The application synthesizes fingerprint images with realistic class, size, shape, frequency, and minutiae distributions.

Operators can specify gender and fingerprint position(s) for the dataset. Operators can also specify NFIQ (quality) distribution, enabling creation of difficult datasets that present challenges for matchers. Biosynthetics fingerprints generate false match rates identical to those of real fingerprints, supporting large-scale testing of AFIS systems.

**FACE**
The Biosynthetics software creates frontal, neutral-expression faces under neutral lighting for white and black male subjects. Face images have an inter-eye distance of ~150 pixels.

In addition to primary facial features such as eyes, nose, and mouth, synthetic faces have realistic hairstyles and hairlines. Biosynthetics face images generate false match rates within an order of magnitude of real images. This supports testing of face images in applications such as MRTD issuance.

**IRIS**
The Biosynthetics software creates realistic, non-occluded irises similar to those acquired by commercial iris recognition devices in operational environments. Iris image diameter is ~220 pixels.

Iris images can be simulated with high, medium, and low quality levels, based on contrast and boundary shape. Biosynthetics irises emulate the texture and structure of real irises, generating false match rates identical to those of real images. This supports testing of iris recognition algorithms in identification applications.
USER INTERFACE & WORKFLOW

The Biosynthetics software uses a single interface to generate synthetic fingerprint, face or iris images with separate screens for “Synthetic Generation”, “Dataset Status”, “Dataset Viewer”, and “Dataset Details”. These screens allow users to adjust parameters used to define the generated datasets, monitor image generation status, and review and filter generated datasets. The interface also allows synthetic image datasets to be exported.

CLIENT-SERVER ARCHITECTURE

Novetta’s Biosynthetics software is a Windows-based client-server application configurable to fit a wide range of customer environments. The Biosynthetics client manages multiple Biosynthetics node servers. High-volume image creation (up to 1m images per modality) can be distributed across dozens of servers, reducing dataset creation time.

The Biosynthetics software is licensed on a site basis, and installations can scale as additional computation power becomes available. Novetta provides onsite installation and configuration assistance for licensees.

FEATURES & BENEFITS

Novetta’s Biosynthetics software generates large-scale, realistic fingerprint, face and iris image datasets. Designed for organizations with large-scale biometric projects - as well as biometric researchers and vendors - Biosynthetics software provides the following benefits and features:

• Dramatically reduces the time, effort, cost, and privacy risks associated with biometric dataset collection.

• Creates millions of unique images per modality with modest computational power.

• Enables accuracy and throughput testing for government, commercial, and academic organizations.

• Generates high-, medium-, and low-quality images with realistic error rates for a wide range of test scenarios.

• Supports creation of custom datasets that reflect key aspects of customer biometric datasets.

CUSTOM DATASET GENERATION

In addition to licensing the Biosynthetics software for onsite customer usage, Novetta generates custom synthetic image datasets – up to 10 million fingerprints, 2 million irises, and 1 million faces – for organizations with specialized needs.