

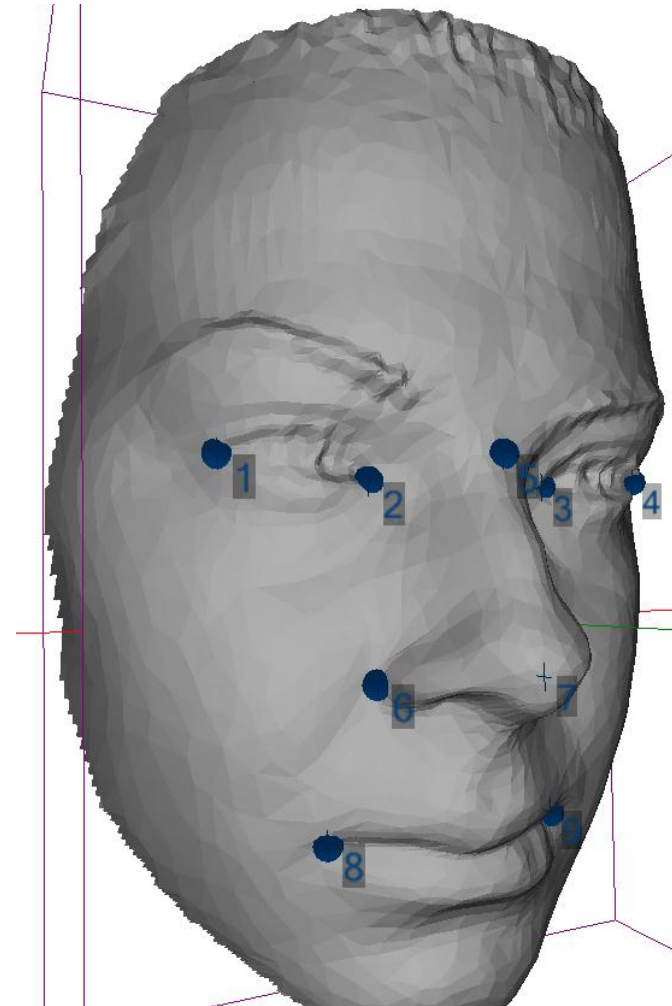
Jan Dupej | CUNI::MFF::CGG

# Geometric Morphometrics

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# Morphometrics 101

- Quantitative analysis of form (size, shape)
- Traditional
  - Lengths, widths, masses, angles, areas etc.
- Landmark-based
  - LMs placed on anatomically significant loci
- Emerging methods
  - Mesh-based
  - Voxel-based

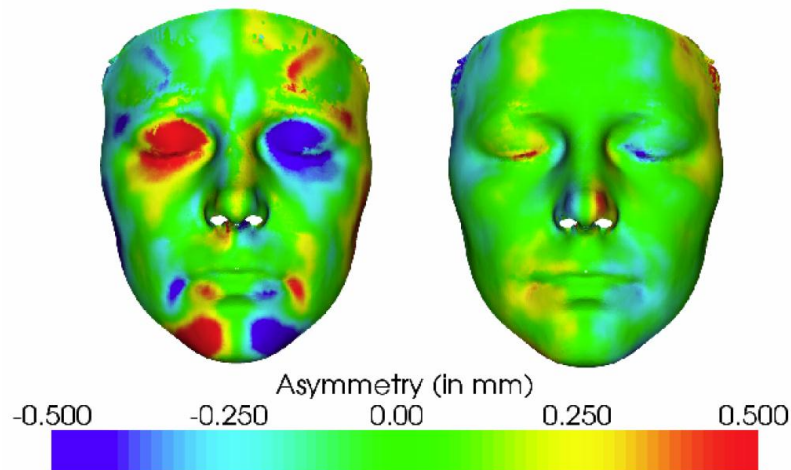


# Morphome3cs

- <http://cgg.mff.cuni.cz/trac/morpho>
- Software for GMM statistical analyses
- Landmark-based
  - 2D + curves (photographs)
  - 3D (meshes, volume data)
- Mesh-based
  - Asymmetry analysis

# Research Areas

- Mesh-based GMM
  - Challenges: alignment, matching topology, registration, actually using the data
  - Can capture details that previous GM flavors miss



# Current Research

- Analyzing directional and fluctuating asymmetry in meshes with dense mesh correspondence (with V. Krajiček)
  - Paper imminent
- Automatic rigid registration of bilaterally symmetric meshes

# Assimilate this!

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- Besl, P. J., & McKay, N. D. (1992). **A method for registration of 3-D shapes.** *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 14(2), 239-256. Published by the IEEE Computer Society. doi:10.1109/34.121791
- Combes, B., Hennessy, R., Waddington, J., Roberts, N., & Prima, S. (2008). **Automatic symmetry plane estimation of bilateral objects in point clouds.** *2008 IEEE Conference on Computer Vision and Pattern Recognition, 2008*, 1-8. IEEE. doi:10.1109/CVPR.2008.4587605
- Audette, M., & Ferrie, F. (2000). **An algorithmic overview of surface registration techniques for medical imaging.** *Medical Image Analysis*, 4(3), 201-17. Elsevier. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/11145309>