Abstract – Digital surfacing of ophthalmic lenses has allowed lens designers to fulfill many design concepts formerly considered impossible with traditional manufacturing methods. This presentation will explore the latest design accomplishments, showcasing the digital possibilities in single vision, PALs, and occupational/computer lenses.

1. Titles
2. Rational and Objectives
   a. Understand why digital surfacing increases design flexibility
   b. Understand the science behind ray-tracing design methods
   c. Discover potential visual value of design goals
   d. Explore today’s leading technology in meeting design goals
3. Digital surfacing advantages
a. Rx optimization
   i. Molded base curve model limitations
      1. One optimized rx per base curve
      2. Rapid deviation from ideal lens designs
   ii. Design optimization for every prescription
      1. PAL design optimization per Rx
      2. Retain best design features for all rxs regardless of deviation from the original ideal design
b. Aberration control
   i. Sphero-cylindrical surfacing limitations
      1. One optimized rx
   ii. Non-sphero-cylindrical surfacing
      1. Carving vs surfacing
         a. Freeform surface
      2. Full Back Surface PAL designs
         a. Freeform surface
            i. PAL design
            ii. Aberration control per rx
   iii. Optimizing aberration control
      1. Tuning the aberration to perform like the design goals
c. Off axis optimization
   i. Limitations of traditional off axis views
      1. Visual issues
   ii. “Sweet spot” size
   iii. Angle of view
d. Inventory management – lens availability
   i. Continuously variable designs
   ii. Same lens blank, multiple designs
      1. Full Back Surface advantage
      2. Multiple PALs
      3. Standard and Short PALs
4. Ray tracing design methods
   a. As-worn optimization
   b. Compensated Rxs at optical center
   c. Off axis angle of view optimization

5. Digital design utilization
   a. As-Worn optimization
      i. Zeiss iTerminal; Essilor Visi-Office
      ii. Physio Enhanced Fit
      iii. Zeiss Individual/Individual 2
      iv. Shamir Autograph II/III
      v. Single Vision Digital
   b. Fixed corridor systems – back to the basics for expert lens designers
      i. Shamir Autograph II/III
      ii. Zeiss Professional Choice/Plus
      iii. Zeiss Individual2 I/B/N
      iv. Unity PLx, PLxtra, PLxpression
      v. Essilor S-Fit/S-4D
   c. Variable rate corridors – getting where you want to go faster
      i. In Touch
      ii. PLx Mobile, PLxtra Mobile
   d. Eye Center of Rotation – optimizing the visual experience away from the fitting cross
      i. Single vision digital – not your everyday aspheric lens
      ii. Zeiss PALs and Single vision
      iii. Essilor Visi-Office with Eyecode
   e. Lifestyle design selection – blending patient visual lifestyle ergonomics with design flexibility
      i. MyStyle
      ii. Individual2 I/B/N
      iii. Ipsio IV
         1. Eye/head movement ratio
iv. Harmony and Clarity

f. Wavefront guided higher order aberration control
   v. iProfilier with iScription
   vi. Physio Enhanced, Varilux S-Series

g. Binocular summation
   i. S-Series

h. It’s a Wrap! – compensating and optimizing for high wrap frames
   i. Oakley/Shamir wrap design
   ii. Shamir Autograph II with Attitude
   iii. Unity PLxtreme