

REDIAcoustics Announces NIRO™ - The First Iterative, Wave-based Program for Optimizing Critical Listening Rooms of any Shape

NEW YORK: Acoustic research and development firm [REDIAcoustics](#) has announced NIRO™ (*Non-Cuboid Iterative Room Optimizer*), a groundbreaking SaaS (software as a service) program designed to optimize critical listening environments and aid in their acoustic design. The program was developed by REDIAcoustics partners, Dr. Peter D’Antonio founder of [RPG Diffusor Systems, Inc](#) and John Storyk founding partner of global architectural acoustic consulting and design firm [WSDG](#).

What is it?

NIRO™ evaluates precise numerical models of small room audio production/listening environments via a series of calculation modules. By conceptualizing the amalgam of Architecture, Acoustics, and Audio, NIRO [iteratively optimizes](#) critical listening environments across the entire audio spectrum. The process guides the design of acoustically neutral environments – by providing a blank acoustical canvas that enables the end user to tailor the response to suit personal taste, by utilizing audio processing. NIRO can vastly improve the neutrality and transferability of your room, so that you are absolutely confident that what you hear in your room will translate to other listening environments.

How does it work?

NIRO™ addresses several forms of acoustic distortion that exist in rooms, such as: (1) The low-frequency response and its temporal decay; (2) The SBIR (Speaker-Boundary Interference Response) due to the proximity of the speakers to a *hard boundary e.g.*, walls, ceiling or floor; (3) The spatial and temporal Reflection Free Zone (RFZ) surrounding the mix position; and (4) The Diffuse Field Zone (DFZ). To correct these physical problems, the room shape, listener, and loudspeaker positions are simultaneously optimized, by specific acoustic treatments applications.

The software utilizes Geometry, Damper and Reflection modules, which can be engaged individually or in series depending on the client’s needs. [The Geometry Module](#) simultaneously optimizes the geometry and positions of loudspeakers and listeners by obtaining the flattest modal response and minimizing the SBIR. It uses a wave-based approach that accurately evaluates *rooms of any shape* and optimizes their variables through a *genetic algorithm*. [The Damper Module](#) designs and applies low frequency treatments at precise frequencies to control the room modes and their temporal decay. All Acoustical Parametric Equalizers (APEQs) designed in the Damper Module are tested in a proprietary impedance tube to verify performance. Finally, [the Reflection Module](#) utilizes geometric acoustics to minimize interfering reflections in the RFZ and ensure the reflection density of the DFZ, through optimal placement of reflection phase grating diffusors, which provide an ambient, enveloping experience.

NIRO™ is the first software to allow iterative optimization of any shaped room, while simultaneously considering source and listening positions. Its accuracy has been verified by real world acoustical measurements of several test case rooms. Based on dozens of room optimizations, NIRO has been tailored to adapt to *any* changes that occur during the optimization process.

Who Can Benefit?

NIRO™ can be seamlessly integrated into the design process of studio designers, acousticians, system integrators and architects. It can also serve as a valuable design service to end users looking to upgrade or design their project studios.

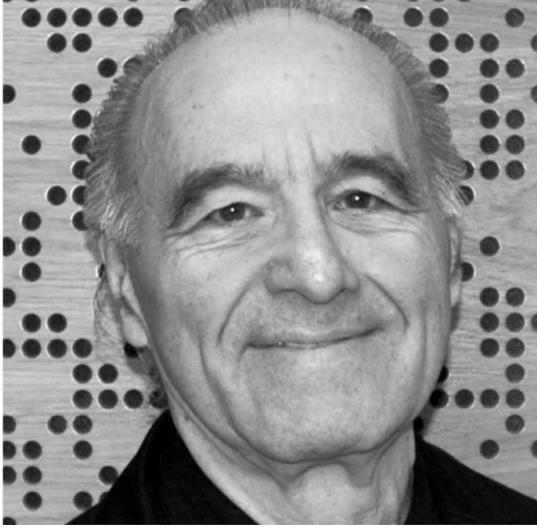
The REDIAcoustics team

A pioneer in the sound diffusion industry, **Dr. Peter D'Antonio** founded RPG Diffusor Systems, Inc. in 1983. He holds numerous trademarks and patents for a wide range of novel, number-theoretic, fractal and optimized diffusing and absorbing surfaces, which have significantly improved the acoustic properties of countless professional audio production and critical listening environments around the globe.

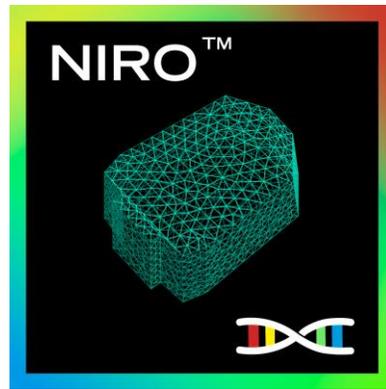
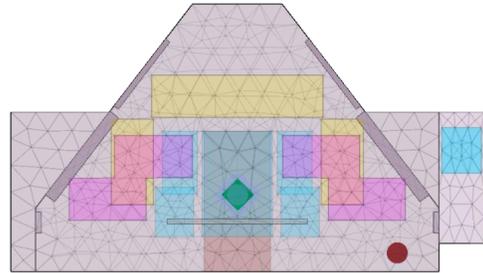
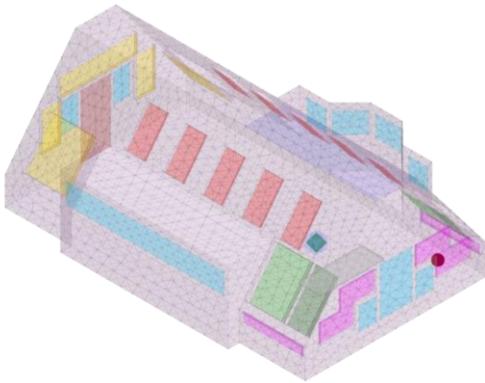
John Storyk's 50+-year career began in 1968 with a commission from Jimi Hendrix to design [Electric Lady Studios](#) in NY's Greenwich Village as the guitar god's personal recording studio (still recording hits for major artists in its original location today.) WSDG has been equally prolific, with global projects ranging from [Jazz At Lincoln Center](#), [Berklee College of Music 160 Mass. Ave.](#) (and Valencia, Spain) and the Herb Alpert Foundation's recent \$9+ million renovation of [The Harlem School Of The Arts](#).

Pro Audio Gear Guru, **PK Pandey**, is the founder of GCPro, Guitar Center's B2B division, owner of Boston's Mad Oak Studios, founder of AVN/SYS audio/video systems design firm, and founded Symphonic Acoustics to manufacture speakers designed by legendary speaker designer George Augspurger.

The REDIAcoustics team also includes **Rinaldi Petrolli**, a skilled acoustic engineer who serves as NIRO's primary Python programmer. **Artur Zorzo**, an accomplished acoustic engineer/programmer with real-time audio signal processing and acoustic measurements experience, and developer of the patented Ear Active Matching (EAM) algorithm. And, acoustical engineer, **Thiago Sanchez**.



1. REDIAcoustics co-founders Peter D'Antonio & John Storyk



2. NIRO Module images developed for the acoustic treatment program for Abbott Road Studio, Boston, MA