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This is the first focused and detailed textbook on acoustic virtual reality. Auralization is the creation of audible acoustic sceneries from computer-generated data. The term "auralization" is to

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be understood as
being analogue to
the well-known
technique of
"visualization". In
visual illustration of
scenes, data or any
other meaningful
information, in
movie animation
and in computer
graphics, we
describe the process

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of "making visible"
as visualization. In
acoustics,
auralization is
taking place when
acoustic effects,
primary sound
signals or means of
sound
reinforcement or
sound transmission,
are processed to be
presented by using

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electro-acoustic
equipment. This
book is organized as
a comprehensive
collection of basics,
methodology and
strategies of
acoustic simulation
and auralization.

When you listen to
music at home, you
would like to have
an acoustic

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impression close to
being in the concert
hall. This is
achieved by an
advanced two-
loudspeaker
technique and
electronic handling
of the signals. The
way to head-related
sound reproduction
and reception to get
the original

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impression is explained in this comprehensive book on the outer influence of hearing and how to achieve perfect stereo effects. The book also introduces a theory of drift thresholds.

This book aims to convey to

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engineering
students and
researchers alike
the relevant
knowledge about
the nature of
acoustics, sound
and hearing that
will enable them to
develop new
technologies in this
area through
acquiring a

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through
understanding of
how sound and
hearing works.

There is currently
no technical book
available covering
the communication
path from sound
sources through
medium to the
formation of
auditory events in

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the brain – this
book will fill this
gap in the current
book literature. It
discusses the

multidisciplinary
area of acoustics,
hearing,
psychoacoustics,
signal processing,
speech and sound
quality and is
suitable for use as a

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includes an in-depth
description of the
physics and
psychoacoustics of
spatial audio as well
as practical
applications.

Chapters include
the history of 3D
sound, binaural
reproduction over
headphones and

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loudspeakers,
stereo, surround
sound, height
channels, object-
based audio,
soundfield
(ambisonics),
wavefield synthesis,
and multi-channel
mixing techniques.
Knowledge of the
development,
theory, and practice

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of spatial and multi-
channel sound is
essential to those
advancing the
research and
applications in the
rapidly evolving
fields of 3D sound
recording,
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virtual reality,
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reader needs to
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audio and high-
resolution
video. The book
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concrete advice
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explanations of
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the daily
success of
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studios. All
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approached from
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that most
readers will be

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more interested
in how these
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depth study of
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and solutions.

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to the success
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burden which
failure may
impose, getting
things right
first time is

essential. The
advice

contained in
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offers workable

ways to improve

the success

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rate of any
studio, large
or small.

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provides a true
A to Z of
recorded sound,
from its
inception to
the present
day, outlining
how
technologies,

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techniques, and
social

attitudes have
changed things,

noting what is
good and what
is less good.

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starts by
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physics of
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generation and

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debate live

sound versus

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and why there

is a

difference,

particularly

with classical

music. Other

topics covered

are the sound

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true stereo
sound; digital
workstations,
sampling, and
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and music

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reproduction in
the home and
how it has
changed. The
author wraps up
the book by
discussing
where we should
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both popular
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music recording
and

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in the 21st
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image distance and
between HRTF and
speech intelligibility
are fully explored, and
measurement and
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methods for HRTF
are examined in
depth. Here,
supplementary
material is provided to
enable readers to
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HRTF by themselves.

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introduction to the
spherical Fourier

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transform and the
formulation of plane-
wave sound fields in
the spherical
harmonic domain. In

turn, the third
chapter covers the
theory of spatial
sampling, employed
when selecting the
positions of
microphones to

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sample sound
pressure functions in
space. Subsequent
chapters highlight
various spherical
array configurations,
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the spherical

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harmonics domain,
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measures of
directivity index and
white noise gain are
introduced, and a
range of optimal
beamformers for
spherical arrays,

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including those that
achieve maximum
directivity and
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are developed, along

with the

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beamformer. The

final chapter

discusses more

advanced

beamformers, such

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as MVDR (minimum
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acoustics,

measurements and
equalization, all of
which need to be
appropriately used to
ensure the accurate
delivery of music
and movie sound

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to listeners. The
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corrects the frequency

and timing response

of your loudspeakers

in your listening

environment so that

the music arriving at

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your ears matches as closely as possible to the content on the recording. Industry guidelines, spanning over 40 years of evolution, are referenced throughout the eBook, providing the recommended target responses for accurate sound reproduction.

Correcting the

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measured response
to known target
responses is, in
effect, matching the
acoustic output signal
arriving at your ears
to the digital audio
stored in a media file.
The target responses
can also be tailored to
your own
preferences. The
chapter on the
acoustics and

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psychoacoustics of
room correction
explains why we hear
what we hear in small-
room acoustics and
what our ears care
about most when it
comes to accurate
sound reproduction.
There are individual
chapters on industry
target responses for
frequency and step
response, group

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curve, reverb time,
polar response and
interaural coherence
coefficient (i.e.,
imaging). Advanced
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design and implement
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driver linearization,
and driver time
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quasi-anechoic
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accuracy. The last
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commercial, and industrial. In this work, the author compares the three most prominent representatives of evolutionary algorithms: genetic algorithms, evolution strategies, and evolutionary programming. The

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algorithms are presented within a unified framework, thereby clarifying the similarities and differences of these methods. The author also presents new results regarding the role of mutation and selection in

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genetic algorithms,
showing how
mutation seems to
be much more
important for the
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than usually
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interaction of
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impact of the
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this experiment
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detailed description
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concepts and theories
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