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Vehicles Design
And Build Your
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Electric Vehicles Design And Build Your Own

This edited open access book gives a comprehensive overview of small and lightweight electric three- and four-wheel vehicles with an

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international scope. The

present status of small

electric vehicle (SEV)

technologies, the market

situation and main

hindering factors for

market success as well as

options to attain a higher

market share including

new mobility concepts

are highlighted. An

increased usage of SEVs

can have different

impacts which are

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highlighted in the book in regard to sustainable transport, congestion, electric grid and transport-related potentials. To underline the effects these vehicles can have in urban areas or rural areas, several case studies are presented covering outcomes of pilot projects and studies in Europe. A study of the operation and usage in

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the Global South extends the scope to a global scale. Furthermore, several concept studies and vehicle concepts on the market give a more detailed overview and show the deployment in different applications.

When Eric Ryan is sent by Teach for America to a hard scrabble high school in the heart of North Carolina's

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NASCAR country, one of the many things he didn't count on was Harold Miller sticking his head into his class one morning and announcing, "Hey Mr. Ryan, we're gonna build an electric car." Two regional utilities had challenged a group of elite schools throughout the South to design and build battery-powered

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electric vehicles.

*Although Ryan's
underprivileged high
school had not even been
on the list, somehow
Miller had managed to
sneak them in and onto
an adventure which not
only began to take over
the lives of Ryan, Miller,
and a local engineer
named George Hawkins,
but an unexpected group
of kids with no visible*

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resources, know-how, or expectations. With an ancient Ford Escort rescued from the compacter, a few hundred pounds of scavenged golf cart batteries, a local minor league NASCAR driver as coach, and the local constabulary looking the other way as the reborn "Shocker" began careening over back

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roads on test runs, the kids (barely) get their pasted together dark horse to the big contest in Richmond, and then, naturally, win the whole thing.

Grid beam is a modular, reusable building system that is fast, easy, affordable, and virtually goof-proof. Ordinary people with few skills and even fewer tools (all

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you need is a wrench!)
can tackle projects
ranging from furniture
and shop benches to
more ambitious projects
like wind turbines, truck
racks, small
buildings—even electric
vehicles. Grid beam's
modular pieces and bolt-
together construction
make the system fast and
straightforward to work
with. It has all the

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advantages of an industrial building system: standard, modular sizes; uniform materials; and interchangeable parts. Projects knock flat and are easy to transport. Since the pieces can be used over and over again, grid beam is easy both on your wallet and on the environment—the authors have been using

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*some of their components
for over thirty years.*

*How to Build with Grid
Beam includes hundreds
of photos of real projects
built over a sixty-year
period, showing the
many uses of grid beam,
from shelves for college
students to projects
involving alternative
energy. The versatility of
grid beam is inspiring for
beginners, more*

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experienced do-it-yourselfers, and innovators who will develop their own designs. Even school-age children can use grid beam to build simple projects. Phil Jergenson is an innovator who built the first grid beam vehicle. Richard Jergenson built his first grid beam project in 1977. Wilma Keppel is a

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*writer and editor who is
also a welder, carpenter,
and grid beam builder.*

*In the past few years,
interest in plug-in electric
vehicles (PEVs) has
grown. Advances in
battery and other
technologies, new federal
standards for carbon-
dioxide emissions and
fuel economy, state zero-
emission-vehicle
requirements, and the*

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current administration's goal of putting millions of alternative-fuel vehicles on the road have all highlighted PEVs as a transportation alternative. Consumers are also beginning to recognize the advantages of PEVs over conventional vehicles, such as lower operating costs, smoother operation, and better

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acceleration; the ability to fuel up at home; and zero tailpipe emissions when the vehicle operates solely on its battery.

There are, however, barriers to PEV deployment, including the vehicle cost, the short all-electric driving range, the long battery charging time, uncertainties about battery life, the few choices of vehicle

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*models, and the need for
a charging infrastructure*

to support PEVs. What

should industry do to

improve the performance

of PEVs and make them

more attractive to

consumers? At the

request of Congress,

Overcoming Barriers to

Deployment of Plug-in

Electric Vehicles

identifies barriers to the

introduction of electric

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vehicles and recommends ways to mitigate these barriers. This report examines the characteristics and capabilities of electric vehicle technologies, such as cost, performance, range, safety, and durability, and assesses how these factors might create barriers to widespread deployment.

Overcoming Barriers to

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Deployment of Plug-in Electric Vehicles provides an overview of the current status of PEVs and makes recommendations to spur the industry and increase the attractiveness of this promising technology for consumers. Through consideration of consumer behaviors, tax incentives, business models, incentive

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programs, and infrastructure needs, this book studies the state of the industry and makes recommendations to further its development and acceptance.

*Build Your Own Plug-In
Hybrid Electric Vehicle
Overcoming Barriers to
Deployment of Plug-in
Electric Vehicles
On-Demand Electric
Vehicles Dial-A-Ride*

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Operation System

Plug-in Electric Vehicle

Grid Integration

Design Fundamentals

Electric Vehicles

A Step-by-Step Guide
to Building a Plug-In
Hybrid Electric
Vehicle from the
Ground Up Written
by clean energy guru
and electric vehicle
expert Seth Leitman,

Page 20/232

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this hands-on guide gives you the latest technical information and easy-to-follow instructions for building a plug-in hybrid electric vehicle (PHEV). "Written by Seth Leitman, longtime green vehicle/sustainability expert and author of "Build Your Own

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Electric Vehicle," this
275-page book

provides an overview
of the technology and
the issues in doing a
conversion, and it
works well as a

different way in to the
open source material
that can be found at ht
tp://www.eaa-

phev.org or the easier-
to-remember http://w

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www.priusplus.org." --

CalCars.org Build
Your Own Plug-In

Hybrid Electric
Vehicle puts you in
the driver's seat when
it comes to hitting the
road in a reliable,
economical, and
environmentally
friendly ride. Inside,
you'll find complete
details on the hybrid

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powertrain and all the
required components,

including the motor,
battery, and chassis.

The book covers the
plug-in hybrids

currently on the
market as well as

hybrid conversion

companies, conversion
kits, and related

resources. Pictures,
diagrams, charts, and

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graphs illustrate each
step along the way.

And Build Your
Own
With this how-to
guide on hand, you'll
be behind the wheel of
your own plug-in
hybrid electric
automobile in no time!

Build Your Own Plug-
In Hybrid Electric
Vehicle covers:

Energy savings and
environmental

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benefits PHEV
background
Drivetrain
components and
design Chassis
selection DC and AC
motor types Batteries
and chargers The
conversion process
Licensing and
insurance Safety,
maintenance,
troubleshooting, and

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warranties Clubs and
associations

Additional resources

Capitalist Nigger is an explosive and jarring indictment of the black race. The book asserts that the Negroid race, as naturally endowed as any other, is culpably a non-productive race, a consumer race that

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depends on other communities for its culture, its language, its feeding and its clothing. Despite enormous natural resources, blacks are economic slaves because they lack the ' devil-may-care ' attitude and the ' killer instinct ' of the Caucasian, as well

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as the spider web
mentality of the Asian.

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Own
A Capitalist Nigger
must embody
ruthlessness in pursuit
of excellence in his
drive towards
achieving the goal of
becoming an
economic warrior. In
putting forward the
idea of the Capitalist
Nigger, Chika

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Onyeani charts a road to success whereby black economic warriors employ the ‘ Spider Web Doctrine ’ – discipline, self-reliance, ruthlessness – to escape from their victim mentality.

Born in Nigeria, Chika Onyeani is a journalist, editor and

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former diplomat.

**BUILD, CONVERT,
OR BUY A STATE-
OF-THE-ART
ELECTRIC
VEHICLE**

Thoroughly revised
and expanded, **Build
Your Own Electric
Vehicle, Third
Edition**, is your go-to
guide for converting
an internal

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combustion engine vehicle to electric or building an EV from the ground up. You'll also find out about the wide variety of EVs available for purchase and how they're being built. This new edition details all the latest breakthroughs, including AC propulsion and

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regenerative braking systems, intelligent controllers, batteries, and charging technologies. Filled with updated photos, this cutting-edge resource fully describes each component--motor, battery, controller, charger, and chassis--and provides

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illustrated, step-by-step instructions on how to assemble all the parts. Exclusive web content features current supplier and dealer lists. Custom-built for environmentalists, engineers, students, hobbyists, and mechanics, this hands-on guide puts you in

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the fast lane toward a cost-effective, reliable green machine. Build Your Own Electric Vehicle, Third Edition, covers: Environmental impact and energy savings The best EV for you--purchase trade-offs, conversion trade-offs, and conversion costs Chassis and

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design Different types
of electric motors and
controllers Lithium
EV batteries Chargers
and electrical systems
EV builds and
conversions Licensing
and insuring your EV
Driving and
maintenance List of
manufacturers and
dealers regularly
updated on website

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Building electric cars, or converting gasoline-powered cars to electric power, has long been a viable and bustling hobby for many automotive enthusiasts. The development of new components and greatly improved materials makes the conversion to electric

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power easier and more effective than ever. In How to Design and Build Modern Electric Vehicles, the authors showcase how to most effectively team the latest and greatest componentry and create truly modern electric cars. New-

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and controllers are all clearly defined and explained, as are the best-possible ways to incorporate modern componentry into a functional and reliable electric vehicle.

Technology and

Expectations in the

Automobile Age

Optimizing a System

of Electric Vehicle

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Charging Stations
A History, 2d ed.
Hybrid Electric
Vehicle Design and
Control: Intelligent
Omnidirectional
Hybrids
Build Your Own
Electric Vehicle
Design and
Simulation of a Fuel
Cell Land Speed
Vehicle Propulsion

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System

The electric vehicle and plug-in hybrid electric vehicle play a fundamental role in the forthcoming new paradigms of mobility and energy models. The electrification of the transport sector would lead to

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advantages in terms of energy efficiency and reduction of greenhouse gas emissions, but would also be a great opportunity for the introduction of renewable sources in the electricity sector. The chapters in this book show a

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diversity of current
and new
developments in the
electrification of the
transport sector seen
from the electric
vehicle point of
view: first, the
related technologies
with design, control
and supervision,
second, the

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powertrain electric
motor efficiency and
reliability and, third,
the deployment
issues regarding
renewable sources
integration and
charging facilities.

This is precisely the
purpose of this book,
that is, to contribute
to the literature

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about current
research and
development

activities related to
new trends in
electric vehicle
power trains.

How to Design and
Build Modern
Electric CarsS-A
Design

Build a roadworthy

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two-seater open sports car for a fraction of the cost of a kit car! Using standard tools, basic skills and low-cost materials, this volume shows you how to make the chassis, suspension and bodywork, and advises you on how

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to modify and use
inexpensive but
serviceable
mechanical
components.

Contains sections on
improving handling,
information on how
to get through the
Single Vehicle
Approval test, and
builders' own stories.

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If you have the
desire to build your
own electric vehicle,
"Building An
Electric Vehicle"
with clear
instructions and
more than 130
pictures in its 180
pages is the book for
you. This book
provides a step-by-

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step approach to
converting an
internal combustion
engine automobile
into an electric
vehicle. You are
taken through the
design and
construction of two
electric vehicles,
showing you
pictures of every

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step. The illustrated principles will help you produce the most efficient vehicle possible. This book follows the design and construction of two electric vehicles from the funding stage to the final driving stage. Unlike

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most "How-To-Books" this book discusses what not to do, in addition to what to do. You can see how some decisions led to some not so desirable results. Included in this manual is useful information on how

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to acquire the needed funding to do the conversion as well as a complete cost breakdown for each vehicle. A cost spreadsheet was used for each vehicle construction to record every cost. A minimal cost estimate to produce

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your electric vehicle

And Build Your

is also

Own

shown. Vehicle

schematics are

included, showing

how to integrate the

drive electronics to

the original vehicle

wiring. The large

pictures in "Building

An Electric Vehicle"

gives you all the

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information you
need to build your
own clean-energy,
electric vehicle.

These full size
pictures make the
book cost more, but
add so much more to
the level of
information
included.

How to Build with

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Own
Grid Beam
The Road To
Success □ A Spider
Web Doctrine
The Electric Vehicle
The Electric Vehicle
Conversion
Handbook HP1568
Global Strategies of
Electric Vehicles: Us
Design and Build
Your First Robot!

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Fun robotics projects that teach kids to make, hack, and learn! There's no better way for kids to learn about the world around them than to test how things work. Building Your Own Robots presents fun robotics projects that children aged 7

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– 11 can complete with common household items and old toys. The projects introduce core robotics concepts while keeping tasks simple and easy to follow, and the vivid, full-color graphics keep your kid's eyes on the page as they

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work through the projects. Brought to

you by the trusted

For Dummies brand,

this kid-focused

book offers your

child a fun and easy

way to start learning

big topics! They'll

gain confidence as

they design and

build a self-

propelled vehicle,

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hack an old remote control car to create a motorized robot, and use simple commands to build and program a virtual robot—all while working on their own and enjoying a sense of accomplishment! Offers a kid-friendly design that is heavy

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*on eye-popping
graphics Focuses
on basic projects
that set your child
on the road to
further exploration
Boasts a small, full-
color, accessible
package that instills
confidence in the
reader Introduces
basic robotics
concepts to kids in a*

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language they can understand If your youngster loves to tinker, they'll have a whole lot of fun while developing their creative play with the help of Building Your Own Robots.

A guide on how to convert any gas- or diesel-powered

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vehicle to electric power. Includes ownership advantages, basic EV operation, subsystems, components, basic EV operation, project vehicles, and conversion kits.

This book provides an insight into the design, modeling,

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*control, and
application of
multiphase hybrid
permanent magnet
machines for
electrified
powertrains in
electric and hybrid
electric vehicles.*

*The authors present
an overview of
electric and hybrid
electric vehicles,*

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*hybrid electric
machine topologies,
hybrid permanent
magnet (HPM)
machine design,
multiphase hybrid
machines, operation
of multiphase
generators in series
hybrid electric
vehicles (SHEV),
and machine
hardware build-up*

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and testing.

Readers will gain an understanding of multiphase machine configuration, their design, control, and recent applications, along with the benefits they provide, and learn general design steps, prototyping, and hardware build-

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*up processes of
multiphase electric
machines.*

*Multiphase Hybrid
Electric Machines:
Applications for
Electrified*

*Powertrains will be
a valuable reference
for undergraduate
and graduate
students,*

researchers, and

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practicing engineers, working on electric/hybrid electric vehicles, as well as electric machine applications in renewable energy systems specifically wind turbines, HVAC systems, robotics, and aerospace industry.

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A complete guide to electric vehicle design, operation, and adoption This hands-on resource thoroughly explains the technologies and techniques involved in the design and operation of today's electric vehicles.

Originally written for

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use in a course co-taught by the authors at Stanford University, Electric Vehicle Engineering discusses the physics of vehicle motion; the electrical principles on which motors rely; the chemistry, operation, and charging of lithium-

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ion batteries; the design and operation of motor controllers; the energy efficiency and environmental impact of electric vehicles; and the policy and economics affecting their adoption. After teaching you the theory, the authors

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will guide you through a hands-on project in which you will build a model electric car from the ground up with a hand-wound electric motor of your own design. Coverage includes:

*Introduction to
electric vehicles
Electric vehicle*

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history Vehicle

dynamics Electric

motors Lithium-ion

batteries Controllers

Well-to-wheels

energy and

emissions analysis

Electric vehicle

policies and

economics Future

prospects

Auto Upkeep

Building an Electric

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Vehicle

*New Trends in
Electrical Vehicle
Powertrains
Multi-Agent System
Applications
The Automobile
Trade Magazine
Building Your Own
Robots*

***"This book is an
introduction to
automotive***

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***technology, with
specific reference to
battery electric,
hybrid electric,
and fuel cell
electric vehicles. It
could serve
electrical
engineers who
need to know more
about automobiles
or automotive
engineers who***

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***need to know
about electrical
propulsion
systems. For
example, this
reviewer, who is a
specialist in
electric machinery,
could use this
book to better
understand the
automobiles for
which the reviewer***

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***is designing
electric drive
motors. An
automotive
engineer, on the
other hand, might
use it to better
understand the
nature of motors
and electric
storage systems
for application in
automobiles,***

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trucks or motorcycles. The early chapters of the book are accessible to technically literate people who need to know something about cars. While the first chapter is historical in nature, the second chapter is a good

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***introduction to
automobiles,
including
dynamics of
propulsion and
braking. The third
chapter discusses,
in some detail,
spark ignition and
compression
ignition (Diesel)
engines. The
fourth chapter***

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***discusses the
nature of
transmission***

***systems.” —James
Kirtley,
Massachusetts
Institute of
Technology, USA***

***“The third edition
covers extensive
topics in modern
electric, hybrid
electric, and fuel***

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cell vehicles, in which the profound knowledge, mathematical modeling, simulations, and control are clearly presented.

Featured with design of various vehicle drivetrains, as well as a multi-

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***objective
optimization
software, it is an
estimable work to
meet the needs of
automotive
industry.” —Haiyan
Henry Zhang,
Purdue University,
USA “The
extensive
combined
experience of the***

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authors have produced an extensive volume covering a broad range but detailed topics on the principles, design and architectures of Modern Electric, Hybrid Electric, and Fuel Cell Vehicles in a well-structured, clear

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***and concise
manner. The
volume offers a
complete overview
of technologies,
their selection,
integration &
control, as well as
an interesting
Technical
Overview of the
Toyota Prius. The
technical chapters***

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***are complemented
with example
problems and user
guides to assist
the reader in
practical
calculations
through the use of
common scientific
computing
packages. It will be
of interest mainly
to research***

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***postgraduates
working in this eld***

as well as

established

academic

researchers,

industrial R&D

engineers and

allied

professionals.”

—Christopher

Donaghy-Sparg,

Durham

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University, United Kingdom The book deals with the fundamentals, theoretical bases, and design methodologies of conventional internal combustion engine (ICE) vehicles, electric vehicles (EVs),

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hybrid electric vehicles (HEVs), and fuel cell vehicles (FCVs). The design methodology is described in mathematical terms, step-by-step, and the topics are approached from the overall drive

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train system, not just individual components.

Furthermore, in explaining the design

methodology of each drive train, design examples are presented with simulation results.

All the chapters have been

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*updated, and two
new chapters on*

Mild Hybrids and

Optimal Sizing and

Dimensioning and

Control are also

included •

Chapters updated

throughout the

text. • New

homework

problems,

solutions, and

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examples. •

**Includes two new
chapters. •**

**Features
accompanying
MATLAB™
software.**

**One hopes, as a
new generation of
electric vehicles
becomes a reality,
The Electric
Vehicle offers a**

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***long-overdue
reassessment of
the place of this
technology in the
history of street
transportation.***

***Presents the story
of a North Carolina
high school whose
students
successfully built
an award-winning
electric car.***

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This book covers the development of electric cars -- from their early days to new hybrid models in production -- together with the very latest technological issues faced by automotive engineers working

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on electric cars, as well as the key business factors vital for the successful transfer of electric cars into the mass market.

Considerable work has gone into electric car and battery development in the

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***last ten years with
the prospect of
substantial
improvements in
range and
performance in
battery cars as
well as in hybrids
and those using
fuel cells. This
book
comprehensively
covers this***

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***important subject
and will be of
particular interest
to engineers and
managers working
in the automotive
and transport
industries.***

Plug-In Hybrid

Vehicle

Technology

Design and Build

Your Own :

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Second Edition

Advances in

Battery

Technologies for

Electric Vehicles

Electric Vehicle

Technology

Explained

How to Convert

Cars, Trucks,

Motorcycles, and

Bicycles : Includes

EV Components,

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Kits, and Project Vehicles

Capitalist Nigger

*Discover how to
choose a quality
repair facility, buy
a car, handle
roadside
emergencies,
diagnose common
problems, and
communicate*

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*effectively with
technicians - all
while saving
money.*

*The quest for
energy
independence and
rising
environmental
concerns are key
drivers in the
growing popularity*

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of electric vehicles

or EVs - electric

and plug-in hybrid

cars. Studies

indicate that for

90% of the

Americans who

use their cars to

get to work every

day, the daily

commute distance

is less than 50 km

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- or 30 mi - and, on the average, the commuter car remains parked about 22 h per day. The EVs have in common the batteries, which provide storage capability that can be effectively harnessed when

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the vehicles are integrated into the grid. The entire concept of using the EVs as a distributed energy resource - load and resource - is known as the vehicle-to-grid or V2G concept. Though I have

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*more than two
decades of
rendezvous with
energy and
diversified energy
sources to quench
the thirst of
humanity, my
specific interest in
electric vehicle
started in 2014
when I joined*

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*Black & Veatch
and got
associated with
prestigious project
of Tesla as
strategist and
adopt the success
model of US
market for
Asia. Tesla Motors
manufactures the
Tesla Model S, the*

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all-electric car that won the Motor Trend 2013 Car of the Year award. While developing the car, Tesla launched a program to aggressively deploy high-

power, fast-

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charging stations
-- "Superchargers"

-- along major
travel corridors
throughout the
United

States. Tesla

awarded Black &
Veatch a contract
to design and
construct pilot
sites in the

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Own
*Supercharger
network. The
Tesla*

*Supercharger U.S.
build-out is the
largest project to
date for the Black
& Veatch team.
Services include
engineering, site
assessment, and
permitting and*

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construction services for Tesla's charging stations. "It's one thing to build one Supercharger site, but it's a totally different thing to build 100 at a time, or have 40 or 50 in construction at

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*any given time.
Black & Veatch
brought an ability
to be able to
expand rapidly,
bring on the
resources
necessary and
also manage the
construction of a
complex project
like that - all*

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Vehicles Design

concurrently."
Kevin Kassekert,
Director,
Supercharger
Deployment and
Energy Efficiency,
Tesla Motors,
Inc. It was my
absolute privilege
to be part of the
team of Black &
Veatch, who is

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Own

now a market leader in the design, construction and integration of complex electric vehicle (EV) and hydrogen/fuel cell vehicle (FCV) infrastructure. My journey started with a Big Bang

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And Build Your
Own

*when B&V
Chairman Steve
Edward pioneered
the Chairman's
Challenge for new
and fresh ideas
from offices
across the global
with the help of an
online contest.
Absolute delight
was my feeling*

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Own

*when my first idea
on a strategic
model of business
capture (I call it
Shark Strategy)
won the most
voted idea of the
challenge out of
hundreds of ideas
submitted by most
of the top brains
of the 10000 odd*

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Own

*employees of the
100 year old firm.*

*It was just the
beginning as in
the next*

*Chairman's
Challenge, I
collaborated with
others in Kansas
HQ to put forth
another idea on
use of Drone for*

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Own
*Industrial
Application and
Project
Management &
Monitoring of
complex nature
like EPC work of
intercontinental
pipelines or
Electric
Transmission
Lines across the*

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*mountains or
dense forest like
Amazon basin. To
my absolute
surprise, our team
won the top award
of the chairman's
challenge and
each team
members were
gifted a real Drone
costing not less*

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than 15000 INR at that time, but unfortunately it could not be shipped to Mumbai for me as Drones for private applications were banned by government of India. My all other team members

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*sent me pictures
of drones awarded
to them. Great
Memories of
Kansas City
Baseball match
cheering Royals
after intensive
strategy meetings
on future of the
company and
American*

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*Supercharger
Infrastructures (*
Read Tesla, Volta
and other
projects). This
book is my
attempt to help
generation next
understand and
support clean
vehicle adoption,
advance clean

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*transportation and
sustainability.*

*A step-by-step
guide to building
an electric*

*motorcycle from
the ground up*

*Written by
alternative fuel
expert Carl Vogel,
this hands-on
guide gives you*

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And Build Your
Own

*the latest
technical
information and
easy-to-follow
instructions for
building a two-
wheeled electric
vehicle--from a
streamlined
scooter to a full-
sized motorcycle.
Build Your Own*

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Electric

Motorcycle puts you in hog heaven when it comes to hitting the road on a reliable, economical, and environmentally friendly bike.

Inside, you'll find complete details on every

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*component,
including motor,
batteries, and
frame. The book
covers electric
motorcycles
currently on
themarket and
explains how to
convert an
existing vehicle.
Pictures,*

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*diagrams, charts,
and graphs*

illustrate each

step along the

way. Whether you

want to get

around town on a

sleek ride or

cruise the super

slab on a tricked-

out chopper, this

is the book for

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you. Build Your

Own Electric

Motorcycle covers:

Energy savings

and

environmental

benefits Rake,

trail, and fork

angle Frame and

design Batteries

and chargers DC

and AC motor

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*types Motor
controllers*

*Accessories and
converters*

*Electrical system
and wiring*

Conversion

*process Safety,
maintenance, and
troubleshooting*

*Explains how to
convert any gas-*

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Own

*or diesel-powered
vehicle to one that
runs on electric
power, including
information on
ownership
advantages, basic
EV operation,
subsystems,
components,
project vehicles
and conversion*

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Vehicles Design
kits. Original.

*Electric Dreams
Electric Vehicle
Engineering
How to Design
and Build Modern
Electric Cars
A Fast, Easy and
Affordable System
for Constructing
Almost Anything
Electric and*

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Transportation

is one of the

industrial

sectors most

impacted by

global climate

change.

Electric

vehicles are e

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energy-
And Build Your
Own
efficient and
often

presented as a
zero-emission
transport mode
to achieve
longer-term de-
carbonization
visions in the
transport
sector.

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Governments
And Build Your
Own

are recognizing
the highest
priority of
development of
public transit
policies for s
ustainability.
Taxis are
visible and
thus electric

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vehicle use in
taxi service
can bring
attention in
urban life to
a commitment
towards
sustainability
in the
public's opin-
ion. For this
reason, this

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lecture note
proposed a
multi-agent
system (MAS)
approach
incorporating
electric
vehicle dial-a-
ride (DAR)
operation and
the
appropriate

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car-pool and
car-sharing
schemes design
for taxi
service. The
dial-a-ride
operation
problem
consists of
designing
vehicle routes
and schedules

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for users who
specify pick-
up and drop-
off requests
between

origins and
destinations.

We have made
some MAS
simulation
studies, which
aims to

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minimize the
total vehicle-
distance
travelled
subject to
meeting all
advanced
customers '
requests, and
constraints on
vehicle
capacity,

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pickup/
And Build Your
Own
delivery time-
window,

customer ride-
time and batte-
ry-charging
restrictions.

In this study,
we designed
vehicle dial-a-
ride operation
system and

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Algorithm
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Own
development
for dynamic
variants of
elec-tric
vehicles DAR,
to enable on-
line
simulations of
realistic
scale for on-
demand

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transit. We
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will also
investigate
robust
solution
approaches for
the stochastic
electric
vehicles DAR.
The insights
obtained in
studying these

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electric
vehicles DAR
variants would
help to build
an integrated
planning model
for location
of charging
stations and
on-demand
transit
request

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management .

This lecture
note is

expected to be
read by
academics

(i.e.

teachers,
researchers
and students),
technology
solutions

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developers and
enterprise
managers. The
authors are
expecting that
the lecture
note will
contribute to
the MAS
technological
concept in
other

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applications.
Finally, the
authors are
grateful to
the readers
for any
constructive
criticism.
A thoroughly
revised third
edition of
this widely

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praised,
And Build Your
bestselling
Own
textbook

presents a
comprehensive
systems-level
perspective of
electric and
hybrid
vehicles with
emphasis on
technical

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aspects,
And Build Your
mathematical
Own
relationships
and basic
design
guidelines.
The emerging
technologies
of electric
vehicles
require the
dedication of

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current and
future
engineers, so
the target
audience for
the book is
the young
professionals
and students
in engineering
eager to learn
about the

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area. The book
is concise and
clear, its
mathematics
are kept to a
necessary
minimum and it
contains a
well-balanced
set of
contents of
the complex

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technology.
And Build Your
Own
Engineers of
multiple
disciplines
can either get
a broader
overview or
explore in
depth a
particular
aspect of
electric or

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hybrid
vehicles.
Additions in
the third
edition
include simula
tion-based
design
analysis of
electric and
hybrid
vehicles and

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their
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powertrain
components,
particularly
that of
traction
inverters,
electric
machines and
motor drives.
The technology
trends to

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**incorporate
wide bandgap
power**

**electronics
and reduced
rare-earth
permanent
magnet
electric
machines in
the powertrain
components**

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have been
highlighted.

Charging
stations are a
critical
component for
the electric
vehicle infras
tructure, and
hence, a
chapter on
vehicle

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interactions

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grid has been

added.

Autonomous

driving is

another

emerging

technology,

and a chapter

is included

describing the

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autonomous
And Build Your
driving system
Own
architecture
and the
hardware and
software needs
for such
systems. The
platform has
been set in
this book for
system-level

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simulations to
develop models
using various
softwares used
in academia
and industry,
such as MATLAB
®/Simulink,
PLECS, PSIM,
Motor-CAD and
Altair Flux.
Examples and

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simulation
And Build Your
Own
results are
provided in
this edition
using these
software
tools. The
third edition
is a timely
revision and
contribution
to the field

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of electric
And Build Your
Own
vehicles that
has reached
recently
notable
markets in a
more and more
environmentall
y sensitive
world.

Introduction.
System design

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and implementa

tion. Four -

Own

wheel

independent

steering

control.

Battery

management

system. Energy

management

system.

Conclusions.

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This
illustrated
history
chronicles
electric and
hybrid cars
from the late
19th century
to today's
fuel cell and
plug-in
automobiles.

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It describes
the politics,
technology,
marketing
strategies,
and
environmental
issues that
have impacted
electric and
hybrid cars'
research and

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development.

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Own

The important
marketing

shift from a

“woman’s car”

to “going

green” is

discussed.

Milestone

projects and

technologies

such as early

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Own
batteries,
hydrogen and
bio-mass fuel
cells, the
upsurge of
hybrid
vehicles, and
the various
regulations
and market
forces that
have shaped

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the industry

And Build Your

are also

Own

covered.

(Black and

White Edition)

The Horseless

Age

The Electric

Vehicle

Conversion

Handbook

Modern

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Own
**Electric, and
Hybrid
Electric, and
Fuel Cell
Vehicles
The Electric
Car**

After a quick turn of a key, we drive our personal vehicles onto the nearest roadway and

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Join a worldwide club that consumes 2.3 billion gallons of petroleum products per day for transportation. Can the world continue pumping this much oil into vehicles and the resulting carbon into the atmosphere? As early as 2007, the United States understood that this way of life is not sustainable, as reflected in President

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George W. Bush's State
of the Union Address:

"It's in our vital interest to diversify America's energy supply -- the way forward is through technology. We need to press on with battery research for plug-in and hybrid vehicles, and expand the use of clean diesel vehicles and biodiesel fuel. America is on the verge of

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technological breakthroughs that will enable us to live our lives less dependent on oil. And these technologies will help us be better stewards of the environment, and they will help us to confront the serious challenge of global climate change." Plug-in Hybrid Vehicle Technology will develop the case for advanced

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vehicles that operate without fossil fuels and review the technology required to make low or no-carbon transportation possible. The second-half of the book will apply these concepts in the design and building of a plug-in hybrid electric vehicle (PHEV) and powering it with 100% renewable fuels. (Will you follow the included

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plans and build one too?)

The result is a truly Zero-Carbon Car.

Advances in Battery Technologies for Electric Vehicles provides an in-depth look into the research being conducted on the development of more efficient batteries capable of long distance travel. The text contains an introductory section on the market for battery

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and hybrid electric vehicles, then thoroughly presents the latest on lithium-ion battery technology. Readers will find sections on battery pack design and management, a discussion of the infrastructure required for the creation of a battery powered transport network, and coverage of the issues

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own

involved with end-of-life management for these types of batteries.

Provides an in-depth look into new research on the development of more efficient, long distance travel batteries

Contains an introductory section on the market for battery and hybrid electric vehicles Discusses battery pack design and management and the

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issues involved with end-of-life management for these types of batteries

Electric Vehicle Battery Systems provides

operational theory and design guidance for

engineers and technicians working to design and

develop efficient electric vehicle (EV) power

sources. As Zero

Emission Vehicles

become a requirement in

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more areas of the world, the technology required to design and maintain their complex battery systems is needed not only by the vehicle designers, but by those who will provide recharging and maintenance services, as well as utility infrastructure providers. Includes fuel cell and hybrid vehicle

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applications. Written with cost and efficiency foremost in mind, **Electric Vehicle Battery Systems** offers essential details on failure mode analysis of VRLA, NiMH battery systems, the fast-charging of electric vehicle battery systems based on Pb-acid, NiMH, Li-ion technologies, and much more. Key coverage

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includes issues that can affect electric vehicle performance, such as total battery capacity, battery charging and discharging, and battery temperature constraints. The author also explores electric vehicle performance, battery testing (15 core performance tests provided), lithium-ion batteries, fuel cells and

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hybrid vehicles. In order to make a practical electric vehicle, a thorough understanding of the operation of a set of batteries in a pack is necessary. Expertly written and researched, *Electric Vehicle Battery Systems* will prove invaluable to automotive engineers, electronics and integrated circuit design engineers, and

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anyone whose interests
involve electric vehicles
and battery systems. *

Addresses cost and
efficiency as key elements
in the design process *

Provides comprehensive
coverage of the theory,
operation, and
configuration of complex
battery systems,
including Pb-acid,
NiMH, and Li-ion
technologies * Provides

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comprehensive coverage
of the theory, operation,
and configuration of
complex battery systems,
including Pb-acid,
NiMH, and Li-ion
technologies

Abstract: The Ohio State
University has had a rich
history racing electric
vehicles. Since 1994, the
team has developed the
support of industry as
challenges have been

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met. The Buckeye Bullet became the worlds fastest electric car in 2003, and became the first electric car to break 300 miles per hour in 2004. Since then, the team has been designing, building, and testing their latest car, the Buckeye Bullet 2. A partnership with Ballard Power Systems and the Ford Motor Company has enabled the team to

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build this hydrogen
powered successor.

Multiphase Hybrid
Electric Machines

One Unlikely Team of
Kids and the Race to
Build the Car of the
Future

Build Your Own Electric
Vehicle, Third Edition
Maintenance, Light
Repair, Auto Ownership,
and How Cars Work -
4th Edition

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Vehicle for a Carbon-

Constrained World

Electric and Hybrid Cars

This

authoritative

new resource

provides a

comprehensive

introduction

to plug-in

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***electric
vehicles
(PEVs),
including
critical
discussions on
energy storage
and converter
technology.
The
architecture
and models for***

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***sustainable
charging infra
structures and
capacity
planning of
small scale
fast charging
stations are
presented.***

***This book
considers PEVs
as mobile***

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***storage units
and explains
how PEVS can
provide
services to
the grid.
Enabling
technologies
are explored,
including
energy
storage,***

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**converter, and
charger**

technologies

for home and

park charging.

The adoption

of EV is

discussed and

examples are

given from the

individual

battery level

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Own

***to the city
level. This
book provides
guidance on
how to build
and design
sustainable
transportation
systems.
Optimal
arrival rates,
optimal***

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Own

***service rates,
facility
location***

***problems, load
balancing, and
demand***

***forecasts are
covered in
this book.***

***Time-saving
MATLAB code***

and background

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tables are included in this resource to help engineers with their projects in the field. Share in the trials and tribulations of turning a bare frame and

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Own

**wrecked Miata
into a
racetrack
demon, and
learn how to
build a sports
car of your
own along the
way. This book
provides
specific
answers to**

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***common
questions and
covers the
entire
building
process,
including the
post-build
fine-tuning of
the car that
is necessary
to extract the***

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***car's full
performance
(and fun)
potential.
Go Green-Go
Electric!
Faster,
Cheaper, More
Reliable While
Saving Energy
and the
Environment***

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“Empowering people with the tools to convert their own vehicles provides an immediate path away from petroleum dependence and should be part of the

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**solutions
portfolio.” –
Chelsea**

**Sexton, Co-
founder, Plug
In America and
featured in
Who Killed the
Electric Car?**

**“Create a
superior
driving**

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***experience,
strengthen
America, and
restore the
planet's ecosy
stems...that's
the promise of
this book and
it's well
worth a read!"***

***– Josh
Dorfman,***

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***Founder & CEO
– Vivavi,
Modern Green
Furniture
Store; Author,
The Lazy Envir
onmental
ist:
Your Guide to
Easy, Stylish,
Green Living.
This new,
updated***

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***edition of
Build Your Own
Electric
Vehicle
contains
everything
that made the
first edition
so popular
while adding
all the
technological***

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***advances and
new parts that
are readily
available on
the market
today. Build
Your Own
Electric
Vehicle gets
on the
expressway to
a green,***

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***ecologically
sound, cost-
effective way
that even can
look cool,
too! This
comprehensive
how-to goes
through the
process of
transforming
an internal***

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***combustion
engine vehicle
to electric or
even building
an EV from
scratch for as
much or even
cheaper than
purchasing a
traditional
car. The book
describes each***

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component in detail---motor, battery, controller, charger, and chassis---and provides step-by-step instructions on how to put them all together.

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***Build Your Own
Electric
Vehicle,
Second
Edition,
covers: EV vs.
Combustible
Engine
Overview
Environmental
and Energy
Savings EV***

Page 200/232

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***Evolution
since the
First Electric
Car Current
Purchase and
Conversion
Costs Chassis
and Design
Today's Best
Motors Battery
Discharging/Ch
arging Styles***

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***Electrical
Systems
Licensing and
Insurance
Issues Driving
Maintenance
Related Clubs
and
Associations
Additional
Resources
There has been***

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a significant increase in the number of electric vehicles (EVs) mainly because of the need to have a greener living. Thus, ease of access to charging facilities is

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***a prerequisite
for large
scale***

***deployment for
EV. The first
component of
this***

***dissertation
research seeks
to formulate a
deterministic
mixed-integer***

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Linear programming (MILP) model to optimize the system of EV charging stations, the locations of the stations and the number of slots to be opened to

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maximize the profit based on the user-specified cost of opening a station.

Despite giving the optimal solution, the drawback of MILP

formulation is

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***its extremely
high
computational
time (as much
as 5 days).***

***The other
limit of this
deterministic
model is that
it does not
take
uncertainty in***

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**to
consideration.
The second
component of
this
dissertation
is to overcome
the first
drawback of
the MILP model
by
implementing a**

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***two-stage
framework
developed by
(Chawal et al.
2018), which
integrates the
first-stage
system design
problem and
second-stage
control
problem of an***

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EV charging stations using a design and analysis of computer experiments (DACE) based system design optimization approach. The first stage specifies the

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***design of the
system that
maximizes
expected
profit. Profit
incorporates
costs for
building
stations and
revenue
evaluated by
solving a***

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***system control
problem in the
second stage.***

***The results
obtained from
the DACE based
system design
optimization
approach, when
compared to
the MILP,
provide near***

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optimal solutions.
Moreover, the computation time with the DACE approach is significantly lower, making it a more suitable option for

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***practical use.
The third
component of
this
dissertation
is to overcome
the second
drawback of
the MILP model
by introducing
stochasticity
in our model.***

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A two-stage framework is developed to address the design of a system of electric vehicle (EV) charging stations. The first stage specifies the

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***design of the
system that
maximizes
expected
profit. Profit
incorporates
costs for
building
stations and
revenue
evaluated by
solving a***

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***system control
problem in the
second stage.***

***The control
problem is
formulated as
an infinite
horizon, conti
nuous-state
stochastic
dynamic
programming***

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***problem. To
reduce
computational
demands, a
numerical
solution is
obtained using
approximate
dynamic
programming
(ADP) to
approximate***

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***the optimal
value
function. To
obtain a
system design
solution using
our two-stage
framework, we
propose an
approach based
on DACE. DACE
is employed in***

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two ways.

First, for the control problem, a DACE-based ADP method for continuous-state spaces is used. Second, we introduce a new DACE approach

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***specifically
for our two-
stage EV
charging
stations
system design
problem. This
second version
of DACE is the
focus of this
paper. The
"design" part***

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of the DACE approach uses experimental design to organize a set of feasible first-stage system designs. For each of these system designs, the

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***second-stage
control
problem is
executed, and
the
corresponding
expected
revenue is
obtained. The
"analysis"
part of the
DACE approach***

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uses the expected revenue data to build a metamodel that approximates the expected revenue as a function of the first-stage system design.

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***Finally, this
expected
revenue***

***approximation
is employed in
the profit
objective of
the first
stage to
enable a more
computationall
y-efficient***

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***method to
optimize the
system design.***

***To our
knowledge,
this is the
only two-stage
stochastic
problem which
uses infinite
horizon
dynamic***

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***programming
approach to
optimize the
second stage
dynamic
control
problem and
the first
stage system
design
problem.***

Moreover, when

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***the designs
obtained from
our DACE
approach and
MILP design
are solved
using DACE-
based ADP
method
(simulation),
an improvement
of***

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*approximately
8% is observed
in the*

*simulated
profit*

*obtained from
ADP design*

*compared to
that of MILP
design*

*indicating
that when*

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***uncertainty is
considered,
DACE ADP***

design

***provides the
better***

solution.

Development

and Future of

Battery,

Hybrid and

Fuel-cell Cars

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***Applications
for
Electrified
Powertrains
Electric
Vehicle
Battery
Systems
Design and
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: First in a
Series***

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***An
And Build Your
Own
International
View on Light
Three- and
Four-Wheelers
Build Your Own
Sports Car for
as Little as
£250 - and
Race It!***