

### INTRODUCTION TO

# NEUROETHICS

#### WHAT IS NEUROETHICS?

A discipline that examines societal values and humans rights issues raised by neuroscience

### WHY DO WE NEED IT?

The brain raises special issues distinct from bioethics

freedom of thought personal identity mental privacy 🛶 autonomy moral agency mental integrity

#### HOW DO WE USE IT?

Neuroethics can be used as a framework for decisionmaking in innovation:

trial design investment diligence product design patient engagement education, training customer aquisition public policy company policy industry standards self governance

Who has the right to use brain data and how can it be used?



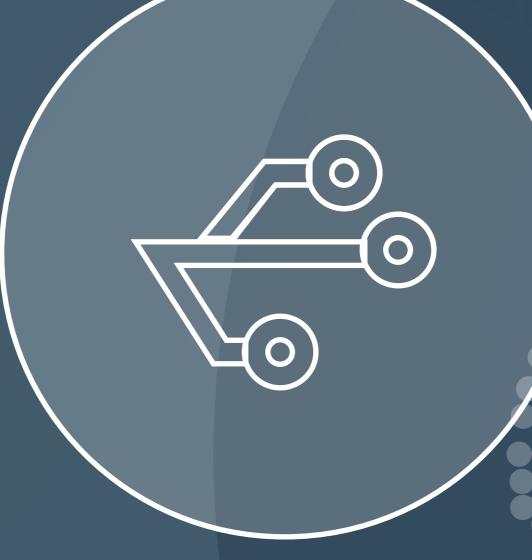
PRIVACY



How will brain technologies affect our sense of self and our free will?

AGENCY, IDENTITY

How can we anticipate potential harmful uses of a technology?



DUAL USE

COMMON THEMES



How do we democratize access to brain-based therapeutics?

How do we ensure the

physical, psychological,

and emotional safety of

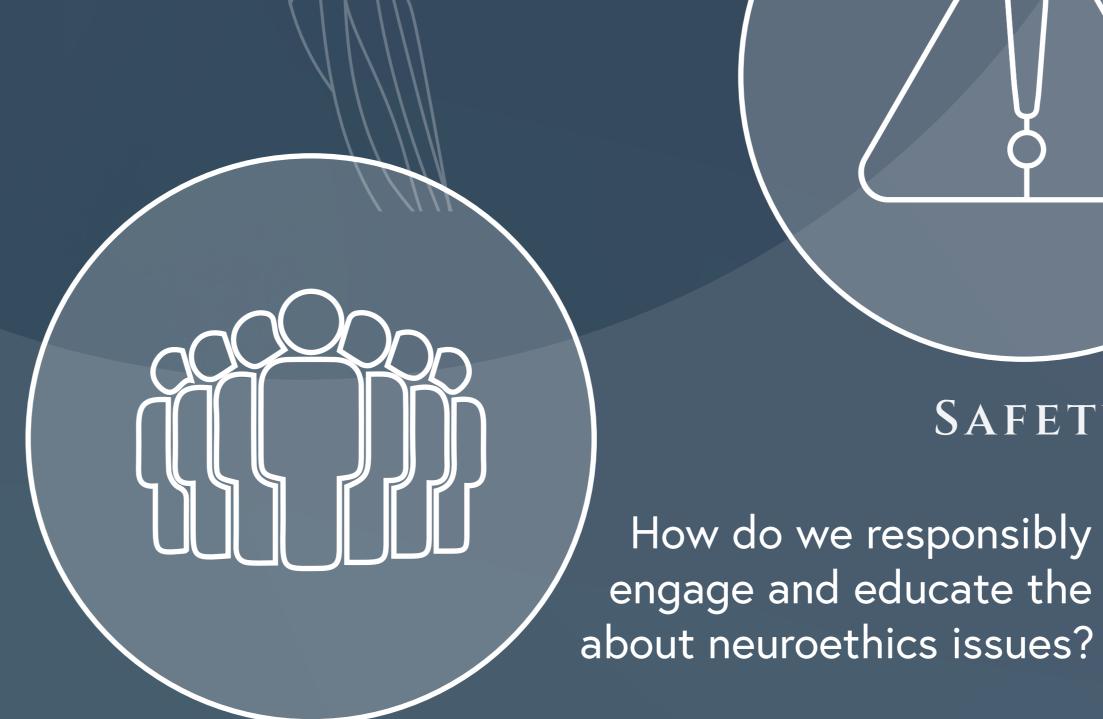
patients and users?

EQUITY AND ACCESS

How can we ensure neurotechnology users are fully aware of the implications of use?



CAPACITY AND CONSENT



SAFETY How do we responsibly engage and educate the public

PUBLIC EDUCATION AND AWARENESS

### EXAMPLES TODAY



Consenting an implanted neurostimulation device that causes personality changes



Use of cognitive enhancement tools in young people with still-developing brains



Considerations for wearables and sensors with respect to data privacy, discrimination

+ Published
Guidelines







First legislation

NEURORIGHTS INITIATIVE

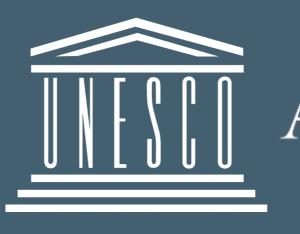


NUFFIELD COUNCIL **BIOETHICS** 

& Frameworks







AMERICAN ACADEMY OF ARTS & SCIENCES

OECD

### VOICES

### Academics

Neuroscientists Ethicists Scienitsts across Disciplines Philosophers Educators Anthropologists

## Private Sector

Investors Entrepreenurs Engineers Corporations Product Designers Philanthropists Employers Professional Groups

### Clinicans

Physicians Surgeons Mental Health Professionals

# Policymakers Government officials

NGOs Lawmakers Judicial system

#### The Public Consumers

Patients Caregivers Marginalized Communities Religious groups

## MILESTONES

Field established First Int'l goup formed 2006 **Dana** Foundation International Neuroethics Society First guidlines First Int'l Neuroethics ROYAL SOCIETY Guidelines

# IMPLEMENTATION CHALLENGES

### PACING PROBLEM "Law is at least five years behind developing a technology" - Julia Griffith, Journal of High Technology Law TECHNOLOGICAL ADVANCEMENT POLITICAL ... Change TIME

#### STAKEHOLDER PROBLEM Innovation is decentralized across sectors, and few

are aware of neuroethics and/or how to use guidelines.



# CALL TO ACTION

The neuroinnovation community needs to collectively commit to ongoing engagement with neuroethics frameworks, and we need mechanisms for accountability across neuroscience stakeholder groups.