



# The Design of a Framework for the Detection of Web-Based Dark Patterns

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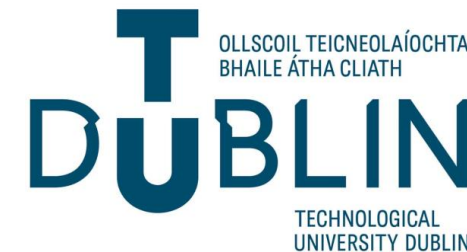


# Ethics4EU Objectives

- The project has the following objectives:
  1. To identify gaps in computer science lecturers' knowledge of ethics
  2. To develop a common understanding of pan-European values in ethics in technology
  3. To develop a repository of open and accessible online curricula, teaching and assessment resources to support computer science ethics
  4. To produce practical guidelines and instructor guides for the teaching of computer science ethics
  5. To develop a sustainable European Community of Practice in computer science ethics
  6. To develop an online training programme through the HubLinked Global Labs model for computer science lecturers in ethics.



# Ethics4EU: Partners



Technological University Dublin, Ireland

European Digital Learning Network, Italy



Informatics Europe, Switzerland



Mälardalens Högskola, Sweden



MÄLARDALEN UNIVERSITY  
SWEDEN

Institut Mines-Telecom, France



## Who are our Audience?

- The content is to be developed to help Computer Science lecturers teach, so there's two types of content being developed:
  1. Content speaking to the lecturer about how to deliver content
  2. Pre-made content aimed at Computer Science Students (1<sup>st</sup> Year to MSc)

## Range of Approaches

Videos

Case Studies

Podcasts

Presentations

Games

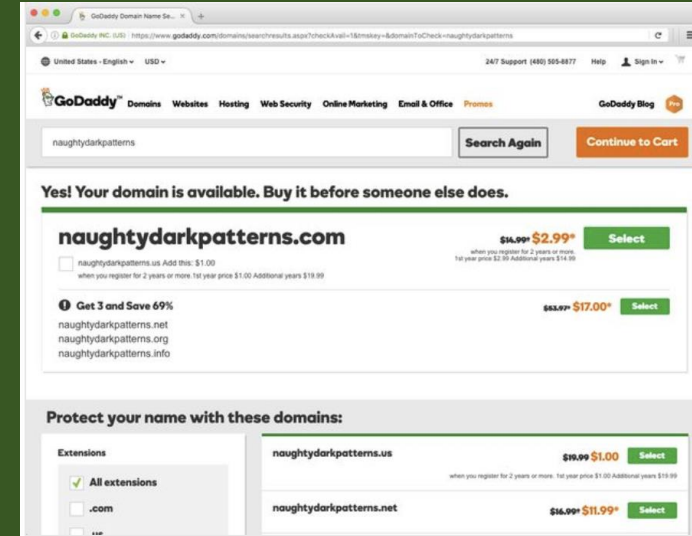
Searching

# Range of Topics

- Dark Patterns Brick
- Developing Countries Brick
- Cyberharassment Brick
- Programming Pitfalls Brick
- Smart Pills Brick
- History of Digital Ethics Brick
- <http://ethics4eu.eu/Bricks/>

# Dark Patterns Brick

- Lesson Content
  - Introduction to Content
  - Exploring the Patterns
  - Ethics of Patterns
- Instructor Guide
- Exam Question
- In-Class and Take-home Activities
- Research Papers



*Some websites use tricks to make people agree to share more data than they intended to, or to spend more money than they planned to.*

# What are Dark Patterns?

- User Interface experts got together and categorized a number of these tricks that are commonly found on websites, and called them *Dark Patterns*.



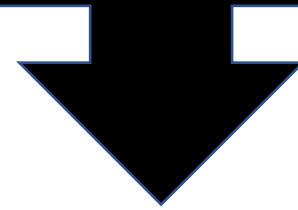
# Dark Patterns: Ethical Concerns

- Dark Patterns trick people:
  - Into sharing information they don't intend to
  - Into paying more than they thought
  - Into subscribing to mailing lists that they don't want to
  - Into downloading programs that are disguised
  - Into spamming their contacts
  - By preventing price comparison
  - By changing the meaning of a commonly used symbol
  - By using guilt to get people to spend more money

# Types of Dark Patterns

- Trick questions
- Sneak into Basket
- Roach Motel
- Privacy Zuckering
- Price Comparison Prevention
- Misdirection
- Hidden Costs
- Bait and Switch
- Confirmshaming
- Disguised Ads
- Forced Continuity
- Friend Spam

**DARK  
PATTERN**



**Trick Questions**

# Trick Questions

- This is very common when registering with a service. Typically a series of checkboxes is shown, and the meaning checkboxes is alternated so that ticking the first one means "opt out" and the second means "opt in".

Please enter your details to reserve your item(s)

Title :

First name \* :

Last name \* :

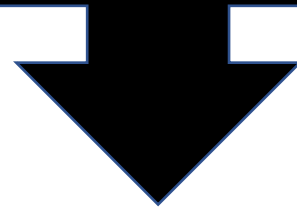
Email \* :

Phone number \* :

Please do not send me details of products and offers from Currys.co.uk

Please send me details of products and offers from third party organisations recommended by Currys.co.uk

**DARK  
PATTERN**



**Sneak into Basket**

# Sneak into Basket

- You attempt to purchase something, but somewhere in the purchasing journey the site sneaks an additional item into your basket, often through the use of an opt-out radio button or checkbox on a prior page.

GoDaddy Domain Name Search

GoDaddy INC. (US) https://www.godaddy.com/domains/searchresults.aspx?checkAvail=1&mskey=&domainToCheck=naughtydarkpatterns

United States - English USD 24/7 Support (480) 505-8877 Help Sign In

GoDaddy Domains Websites Hosting Web Security Online Marketing Email & Office Promos GoDaddy Blog

naughtydarkpatterns Search Again Continue to Cart

**Yes! Your domain is available. Buy it before someone else does.**

**naughtydarkpatterns.com** ~~\$16.99~~ **\$2.99\*** **Select**  
when you register for 2 years or more. 1st year price \$2.99 Additional years \$14.99

naughtydarkpatterns.us Add this: \$1.00  
when you register for 2 years or more. 1st year price \$1.00 Additional years \$19.99

**Get 3 and Save 69%**  
naughtydarkpatterns.net  
naughtydarkpatterns.org  
naughtydarkpatterns.info

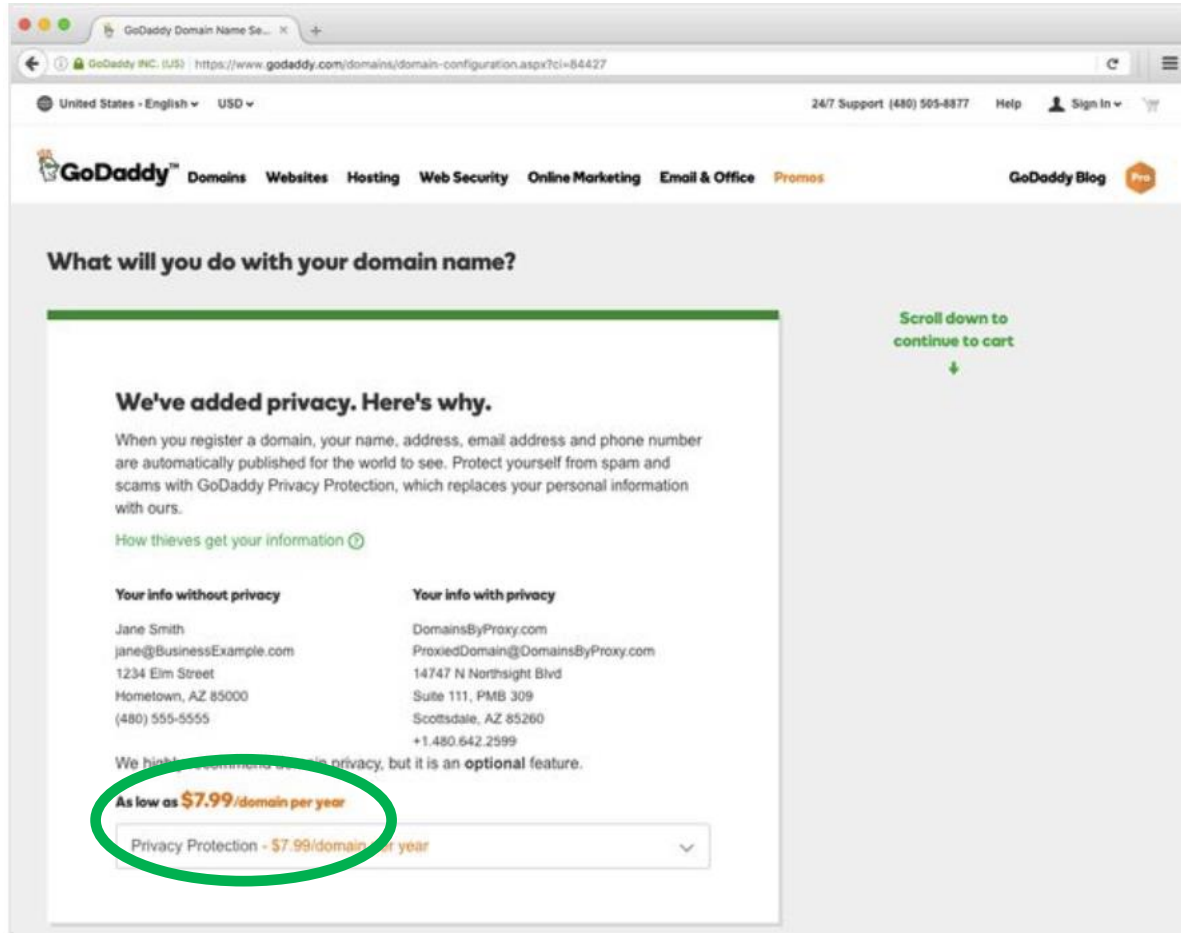
**Protect your name with these domains:**

Extensions  
 All extensions  
 .com  
 .us

naughtydarkpatterns.us ~~\$19.99~~ **\$1.00** **Select**  
when you register for 2 years or more. 1st year price \$1.00 Additional years \$19.99

naughtydarkpatterns.net ~~\$16.99~~ **\$11.99\*** **Select**

# Sneak into Basket



GoDaddy Domain Name Setup

United States - English USD 24/7 Support (480) 505-8877 Help Sign In

GoDaddy Domains Websites Hosting Web Security Online Marketing Email & Office Promos GoDaddy Blog

### What will you do with your domain name?

Scroll down to continue to cart

#### We've added privacy. Here's why.

When you register a domain, your name, address, email address and phone number are automatically published for the world to see. Protect yourself from spam and scams with GoDaddy Privacy Protection, which replaces your personal information with ours.

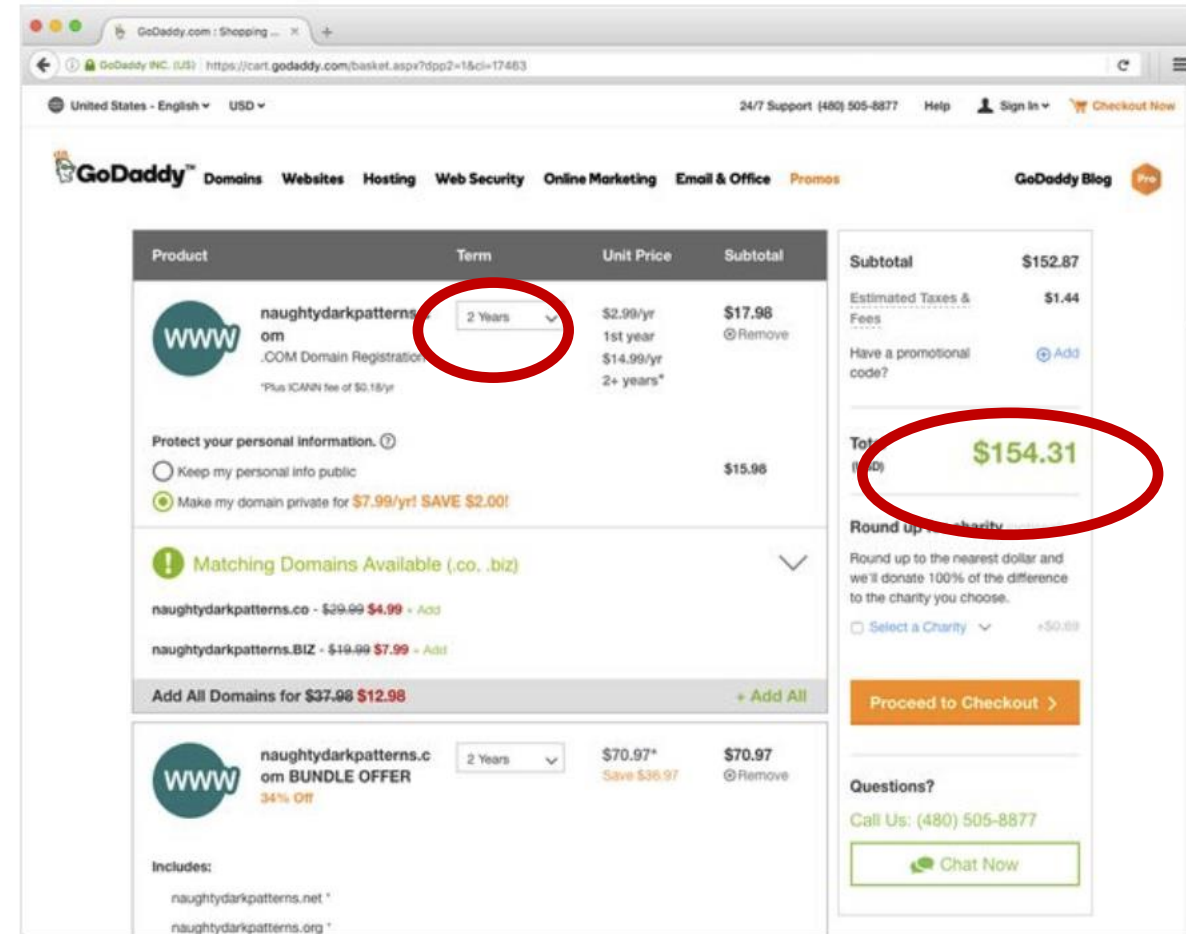
How thieves get your information

Your info without privacy	Your info with privacy
Jane Smith jane@BusinessExample.com 1234 Elm Street Hometown, AZ 85000 (480) 555-5555	DomainsByProxy.com ProxiedDomain@DomainsByProxy.com 14747 N Northsight Blvd Suite 111, PMB 309 Scottsdale, AZ 85260 +1.480.642.2599

We highly recommend domain privacy, but it is an optional feature.

As low as **\$7.99/domain per year**



Privacy Protection - \$7.99/domain per year



GoDaddy.com : Shopping

United States - English USD 24/7 Support (480) 505-8877 Help Sign In Checkout Now

GoDaddy Domains Websites Hosting Web Security Online Marketing Email & Office Promos GoDaddy Blog

Product	Term	Unit Price	Subtotal
 naughtydarkpatterns.com .COM Domain Registration <small>*Plus ICANN fee of \$0.18/yr</small>	2 Years	\$2.99/yr 1st year \$14.99/yr 2+ years*	\$17.98 Remove
Protect your personal information.			\$15.98
<b>Matching Domains Available (.co, .biz)</b>			
naughtydarkpatterns.co - <del>\$29.99</del> \$4.99 - Add			
naughtydarkpatterns.BIZ - <del>\$19.99</del> \$7.99 - Add			
Add All Domains for \$37.98 <b>\$12.98</b> + Add All			
 naughtydarkpatterns.com BUNDLE OFFER <small>34% Off</small>	2 Years	\$70.97* Save \$36.97	\$70.97 Remove
Includes: naughtydarkpatterns.net * naughtydarkpatterns.org *			

Subtotal \$152.87  
Estimated Taxes & Fees \$1.44  
Have a promotional code? Add  
Total (USD) **\$154.31**

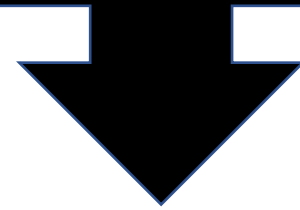
Round up to nearest dollar and we'll donate 100% of the difference to the charity you choose.  
Select a Charity +\$0.89

Proceed to Checkout

Questions?  
Call Us: (480) 505-8877  
Chat Now

2 years was “sneaked into basket”. Costing of multiple domain names was unclear from the outset.

**DARK  
PATTERN**



**Roach Motel**

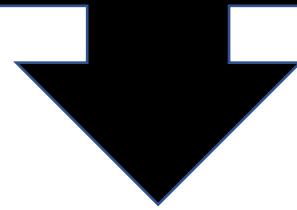


# Roach Motel

The screenshot shows the checkout page on <https://www.livenation.com/checkout/order>. The page layout includes a 'Price Details' section at the top right with fields for 'SUBTOTAL', 'Tickets/Items', and 'TOTAL CHARGES', all of which are redacted with black boxes. Below this is a 'Select Payment Method' section with options for 'Gift Card' and 'Voucher Code'. Further down, there are sections for 'Age Restrictions' and 'Shipping & Billing Restrictions'. The 'Ticket Special Bonus' section offers a 'One year subscription to Rolling Stone Magazine' for a \$12.95 value. A checkbox labeled 'I decline the bonus subscription to Rolling Stone Magazine' is present and is circled in purple. At the bottom right, a 'Time left to complete page' timer shows '08:32'.

- When purchasing tickets, *livenation.com* tries to sneak a subscription to a magazine ( **into your basket** via a **trick question** on the checkout page, shown in screenshot.
- Note that the design is "opt out" - the purchase is made for you automatically unless you notice the checkbox and realise you need to tick it to opt out.

**DARK  
PATTERN**



**Privacy Suckering**

# Privacy Zuckering

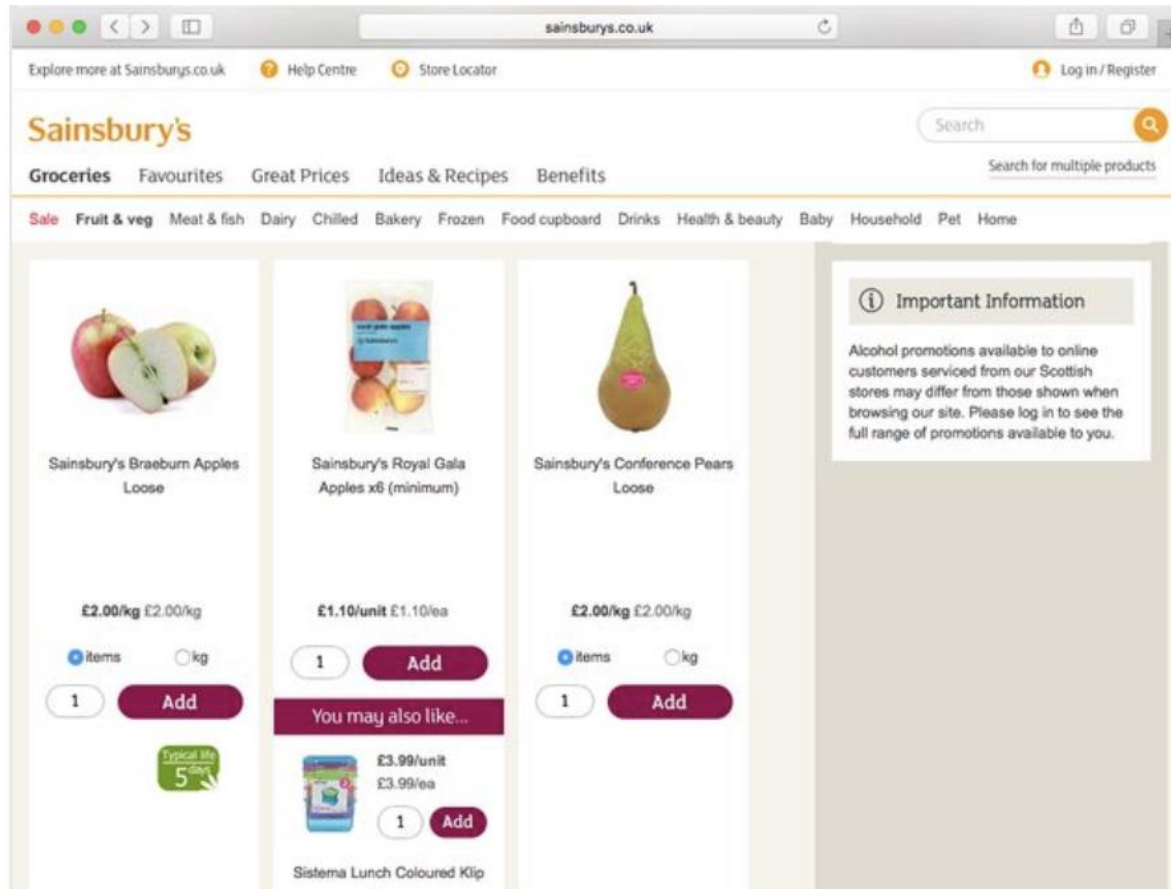
- You are tricked into publicly sharing more information about yourself than you really intended to. Named by **Tim Jones** as a homage to Facebook CEO Mark **Zuckerberg**.
- In its early days, Facebook had a reputation for making it difficult for users to control their privacy settings, and generally making it very easy to "overshare" by mistake. In response to feedback from consumers and privacy groups, Facebook has created a clearer, easier to use privacy settings area.

**DARK  
PATTERN**

**Price Comparison Prevention**

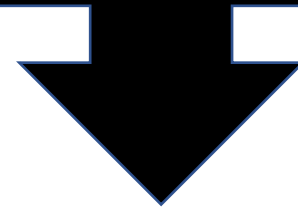
# Price Comparison Prevention

- The retailer makes it hard for you to compare the price of an item with another item, so you cannot make an informed decision.



- Retailers typically achieve this by creating different bundles where it is not easy work out the unit price of the items within the bundles.
- In the Sainsbury's website, it is not possible to compare the price of the first item to the second item.

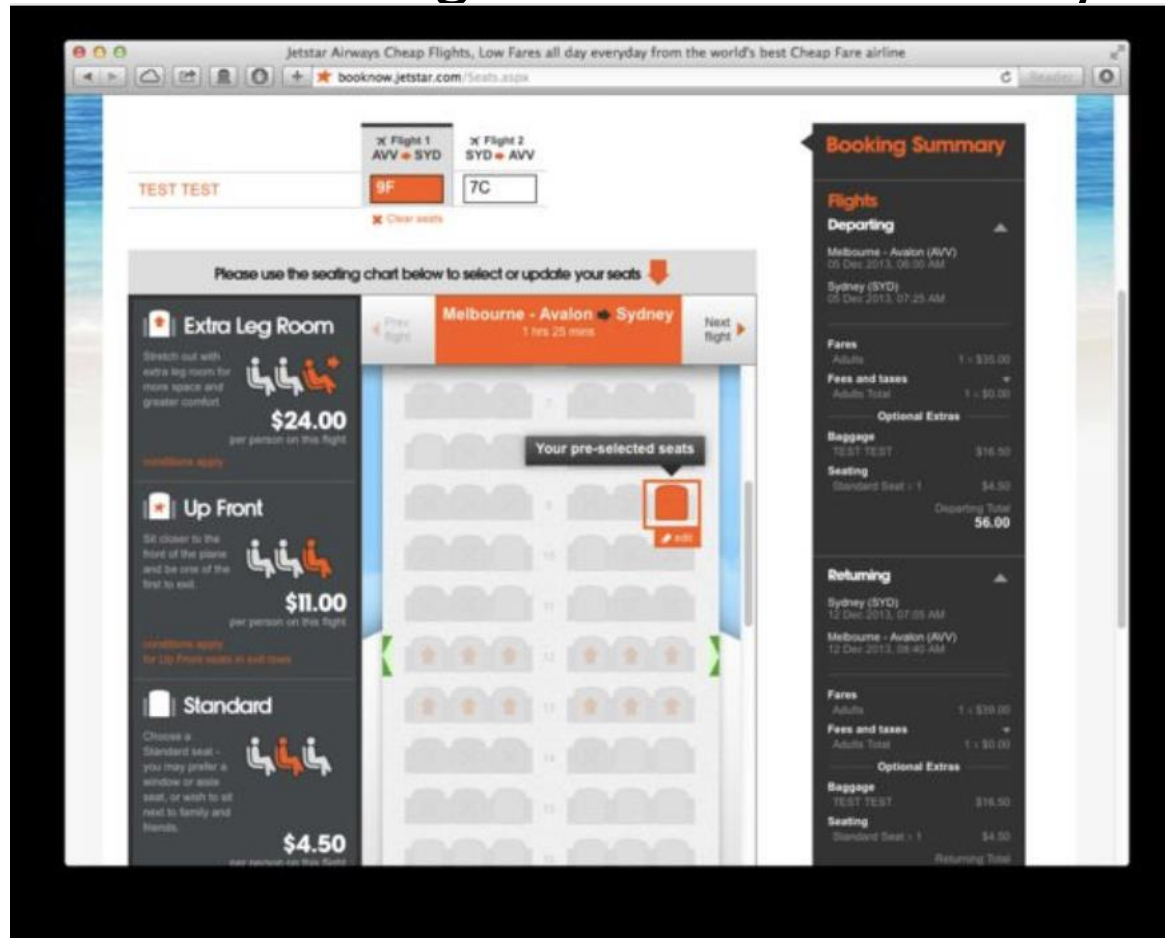
**DARK  
PATTERN**



**Misdirection**

# Misdirection

- The design purposefully focuses your attention on one thing in order to distract you attention from another.




- ▶ On [jetstar.com](http://jetstar.com), when this page loads, they have already preselected a random seat for you.
- ▶ They use word-play trickery, as a "preselected" random seat here costs \$5, but if you opt out via the tiny "skip seat selection" link at the bottom of the page, you're assigned a random seat without the \$5 charge.

# Framework

Category	Pattern	Detection	Rationale
Sneaking	Sneak into Basket	Manual (fully)	Highlight changes in cost
	Hidden Costs	Manual (fully)	Highlight changes in cost
Misdirection	Trick Questions	Automated (partially)	Look for phrases like “opt-in” and “opt-out”, as well as pre-ticked checkboxes
	Misdirection	Cannot be detected	There is too much variation in how this pattern is implemented.
	Confirmshaming	Cannot be detected	There is too much variation in how this pattern is implemented.
	Disguised Ads	Automated (partially)	Look for buttons (noting colour and size) and see which ones link to external sites.
Obstruction	Roach Motel	Automated (fully)	Look for sites with “activate” or “subscribe” links or buttons but with no “deactivate” or “unsubscribe”
Forced Action	Forced Continuity	Cannot be detected	There is too much variation in how this pattern is implemented.
Variegations	Privacy Zuckering	Cannot be detected	There is too much variation in how this pattern is implemented.
	Price Comparison Prevention	Manual (fully)	Highlight if products are displayed with different units of the product
	Bait and Switch	Cannot be detected	There is too much variation in how this pattern is implemented.
	Friend Spam	Automated (partially)	Check if the site asks for email or social media permissions, and notify users.



**Percentage of the webpage visible in your browser window**



**Number of checkboxes On page:**  
**15**

**Pre-ticked checkboxes On page:**  
**7**

**Number of Radiobuttons On page:**  
**5**

**Pre-ticked Radiobuttons On page:**  
**0**

**Shopping Basket Total:**  
**0.00**

# Acknowledgements

[www.Ethics4EU.eu](http://www.Ethics4EU.eu)

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